

THE KNOWN MAN
OR
AN EXPLANATION OF
"THE PHENOMENA OF LIFE"

PALMER

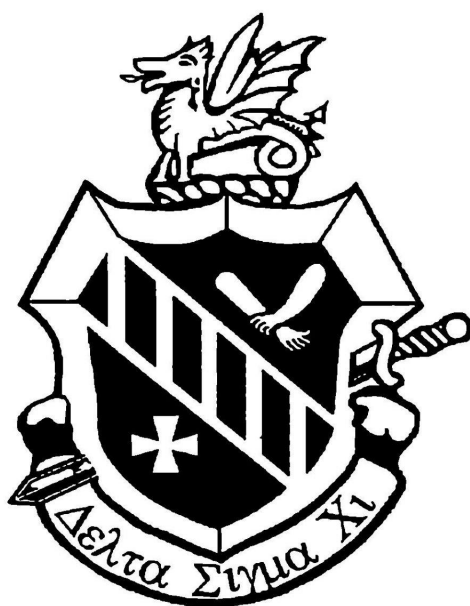
**THE
KNOWN
MAN**

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THE KNOWN MAN

or

An Explanation of
“The Phenomena of Life”

or

Constants and Variables
As Applied to Accuracy of
The B. J. Palmer Chiropractic Clinical Procedure

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DEDICATION

Chiropractors come and Chiropractors go, many remaining true to the principle and practice of the Founder of Chiropractic; many forgetting what little they knew, caring less whether they remember, desiring to slip and slide for themselves, thinking less of humanity.

This edition is dedicated to those who remain true, who follow the development of Chiropractic from the purity of a principle thru its stages to where practice became equal to principle; to that group who never waver in confidence and understanding, who study relentlessly to know all and more, who come home annually to meditate at the foot of the statue of its founder and to bask in the radiance of the fountain of pure and undefiled Chiropractic at its Fountain Head stream.

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If the specific for the cause of all dis-ease has been finally located, nothing we could say for it can make it more than it is; and nothing anybody would say against it can make it less than it is.

I have confidence in humanity to know that when they know that the specific for the cause of all dis-ease has been reached, proved, and can be adjusted, and sickness of all kinds can be regrown well, they will endorse and support with students the one institution teaching it, in spite of all ridicule, prejudice, and opposition that may be heaped upon that discovery or that institution or that personality associated with it.

When the Chiropractic profession arrives at that stage of understanding that The B. J. Palmer Chiropractic Clinic is endorsing, supporting, teaching and practicing a knowledge and adjustment of the specific for the cause of all dis-ease, then that will transcend personal ridicule, malicious prejudice, and selfish opposition.

Affirmation or denial of
the specific for the cause of
all dis-ease cannot make or
break it! It it proves true, it
will live. If it proves false,
it will die!

All of us who understand
must become apostles and
disciples of old and go into
the highways and byways
and carry the new message
of human service of the
specific for the cause of all
dis-ease, to those who need
yet refuse to see the light.

The producer of the specific for the cause of all disease may be personally objectionable, but if the product be professional food fit for angels, the product will live in spite of angels denying the product, or the support of the devils shouting the praises of the producer.

PREFACE

This book started out to be a short article on why we builded and used a shielded and grounded NCM reading booth. From that we went into why we builded and grounded other booths wherein sensitive and accurate measurement methods were used to record varying effects and by-products of mental impulse currents in the human body. Gradually it was enlarged to embrace the fundamental under all scientific clinical research work—constants and variables—which we met and ironed out as we practically applied them in clinic work on cases, in opposition to the usual erratic and haphazard ways they are applied. From one department to another the articles spread. Out of all this grew that salient issue that **Chiropractic was an all-sufficient principle and practice to get sick people well if the constant was rigidly adhered to and variables were as insistently eliminated.** How well that has been accomplished is the text of this book. To develop the principle, build the equipment, and offer proof has been a gigantic task, introducing new subjects, efficiently stepping-up old ones. The B. J. Palmer Chiropractic Clinic today is the last word in constant efficiency rigidly followed.

We began working on this book immediately following Lyceum, 1935, for it was then The B. J. Palmer Chiropractic Clinic was opened and our observations of methods and application began to take form. It was then we began to observe discipline which this book thoroly portrays. We have been continuously at work on its production until the date of its publication.

While we were conducting this research work and

writing this book, "Man, the Unknown," was issued by Alexis Carrel; also "The Phenomena of Life" by George Crile, M.D. These works cover subjects which this book was discussing. It was natural we should quote from them in our Addenda which are as much proof of our work as any recent books published. It was because of these two works that we have taken part of the title of this production.

Research upon which this book is premised was continuously in process covering years leading to definite conclusions which crystallized and took form upon proper laboratories and equipment being installed and practically applied in The B. J. Palmer Chiropractic Clinic after its opening August, 1935. This book began to be written at that date. Matter covers one general subject, but the discerning reader will find one major contradiction: in places and in parts (copy written before appearance of "The Phenomena of Life"—Crile) set forth the principle that drugs, narcotics, etc., influence their normal flowing process. In places and parts (copy written since appearance of that book) we set forth the principle that drugs, narcotics, etc., directly affect their normal flowing process. Rather than change copy, we left it as was.

Chiropractic is a new principle, new practice and attains a new result. D. D. Palmer gave it birth in 1895. He was the founder of The Palmer School of Chiropractic, "The Chiropractic Fountain Head." B. J. Palmer nursed, developed, and defended this principle and practice thru these many years. The same mind that developed the philosophy, science, and art of pure and unadulterated Chiropractic and taught it to 95% of the practicing Chiropractors, is the mind at work developing the practical clinical side of

the application of Chiropractic to the sick, proving that what he has taught, he now practices; that it works in practice as he taught thousands it would. B. J. Palmer and his Teaching Staff of The Palmer School of Chiropractic, and his Clinical Staff of The B. J. Palmer Chiropractic Clinic are following thru that which they have taught. They have been year by year stepping up its efficiency in the class room as well as in our private Clinic now. Many exacting details which have been taught but rarely used in the profession are here being used in their most exacting demands. B. J. Palmer is personally proving his principles and practices, in his Clinic, under his directing guidance, doing no less here in practice than that which he has always taught. No longer can the profession contend he does not know the scientific, professional, and economic sides of a practice; that it is necessary to yield on this or that below a standard to maintain existence. He is proving that a Chiropractor can confine himself to the highest standards conceivable exclusively to Chiropractic; and after such is done here, he still knows more about how to get sick people well than those who would question his right or ability. He is proving his principles work better than he dared to suggest.

This book, then, is full of those practical clinical methods, as original as all other work in teaching class-room fields. This book gives new angles to old subjects, brings forth new subjects in their entirety, showing how all directly tie-in in building a system of how to get the sick well. There isn't much difference between mental instruction of a correct philosophy, scientific work of class room, efficient adjusting drills, accurate art of how to give an adjustment, and doing any or all of it the same way in the

Clinic. If one was practical, it should harmonize with the practice.

Up to within the past year, it has been a more or less persistent cry from some of our profession (with whom we differed in matters clinical) that the trouble with the Faculty of The P. S. C. was that we were teachers, we taught much, suggested much, changed much, from year to year never agreed, evolved much along philosophical lines, taught how to do things in school clinics, but that few if any of us knew much that was practical about how to take care of sick people; although we had been teaching Chiropractic forty years, we could not possibly know anywhere near as much as some of our graduates who had been taught by us, graduated from here, opened an office and practiced a few years.

Chiropractic was born and was developed in the clinic in contradistinction to the laboratory. Its continuous demonstrations and proof have been clinical. Notwithstanding this, it was assumed we did not know what we taught, because we challenged many antipodal methods many of our practitioners practiced. Chiropractic never did get into the laboratory until The B. J. Palmer Chiropractic Clinic was born. Maybe now our field practitioners will have less ground for contending we do not know how to operate an office practice as well as they.

What, then, was more natural than that we should open a Clinic, get into practice, face problems of sick people and prove the field wrong with the necessity of mixing, or prove our principles and practices correct by getting sick people well with Chiropractic alone.

The field told us we knew little about such. If so,

it was time we were finding out about it all. Now that we have builded The B. J. Palmer Chiropractic Clinic, have gotten into the issue squarely, we find our minds continuing to develop new Chiropractic ideas in our Clinic, the same as we formerly did, in research work in philosophy, etc.

The B. J. Palmer Chiropractic Clinic is the highest example of efficient, competent, and honest Chiropractic. It lays down hundreds of rules how success in getting sick well **has been** attained; not the class room where we taught how it **could be** attained. It lays down rules why Chiropractors fail to duplicate this, and why they become mixers; not that they did not have Chiropractic, know Chiropractic, but that they did not exactly use it.

This Clinic has been the mecca for Chiropractic failures, where Chiropractic was used to get sick well. Chiropractors and immediate family failures have been 35% of the sick who visited us. Comparison of principles and practices between Chiropractors who failed on cases and our work here, indicates we did nothing different than they were taught and which they should have done at home. It also indicates we **did do something different which was Chiropractic, which he did not do at home.** If I were a Chiropractor, I would want to know those differences which I should have done, which I didn't do, that failed; which were done here, that succeeded.

This book again brings forth the penalty of leadership. Chiropractic peculiarly has been blessed or cursed with many writers, articles, spoken, written, and printed—people who claim leadership. They issue methods, theories, forced salesmanship; print bulletins, magazines; head associations, etc. **What have they ever written that was new,**

that possessed symptoms of originality? Cite one article or idea any one gave birth to! These assumers rewarmed years-old hash many times, serving heavily seasoned with medical dope—but it was still hash.

The same mind that researched better ways year after year to sustain, develop, defend, and teach Chiropractic in 41 years past, is the same mind still at work now with clinical research as revealed in this book. This work, like others by same author, contains new ideas. It speaks for itself where leadership lies. It proves that other men who were once here, who thrived on reflected glory, were, when thrown upon their own resources, so many duds who could not write except as they blank repeated the old ideas of former years with second-hand reflections. The profession has long learned that they never did develop anything and have not done so when thrown upon their own resources.

There has always seemed something wrong somewhere with some people in some ways. Students come to The P. S. C., we teach and they learn Chiropractic. They pursue a clinical practice while here and get sick people well. They leave, go into the field, open an office, and get sick people well. A trifle later, something slips and results don't come. The doctor then says something like this: "I don't know what's wrong with Chiropractic, but it fails too often. I guess I'll look into this, buy that, and try something else." He may not know it, but he is greasing the track. He gets into a mental and physical slump; he keeps going from bad to worse. Without knowing how or why, he drifts back to some PSC Lyceum. He gets the old idea back again; he hears us tell him Chiropractic is an all-sufficient idea. He goes home, gets out his training stool, steps-up speed; gets down books, and reviews school

notes; gets back to the back once more, and finds patients do get well once again with Chiropractic. Out go the adjuncts and modalities! What's wrong with Chiropractic? Nothing, except that it seems to attract a group of radicals who can't understand it fully, thoroly, and consistently! What's wrong with Chiropractors? Nothing more than that they suffer with the same common hoof and mouth dis-ease that other cross-sections of humanity suffer with—the inability to get right with a right principle and practice, and stay with it. Chiropractic is growing more sound year by year; assuming its manhood and objectives; reaching the pinnacle set forth by D. D. Palmer when he laid down the specific principle. Chiropractors—I am sorry to say—in the majority run around in circles; many of them like chickens with heads off. Knowing them as I do, I should be very loath to trust my back-bone to many of them. I can't blame sick people who write me thousands of the most pitiful, harrowing tales of what they are getting under its name.

In Chiropractic there are two general classifications of practitioners:

First. He who is careless, shiftless, sloppy. This type of man has dirty offices, dirty personnel; his office procedure is indifferent. His NCM readings are carelessly made, spinographic work is poorly postured, indifferently exposed, possibly developed in an old developer. He cares little how he reads films. His adjustments are so-so, etc.

This fellow is playing carelessly with a careful subject, incompetent with a competent method. He is not getting sick people well with Chiropractic. He is a slipper, mixer, back-slider, seeking other fellow's grass, peeking around

corners for something which he thinks might do what he isn't doing. He seeks a short easy cut to success.

Second. This man is careful, neat, accurate, efficient, competent. You can see it in the way he speaks, looks, thinks, acts. His offices reflect careful personality. They are spotlessly clean; everything in its place and a place for everything. This man is painfully exacting in detail, nothing being too small to be done just exactly right. NCM readings are done correctly, spinographs are clear, developers and hypos are capable of delivering; he studies films and is accurate in study and analysis. His adjustments must be exactly right.

This fellow is efficient, accurate, competent, and honest within himself. He has a successful business, his clientele are discriminatory people. His business is of sick people getting well. He checks himself carefully, he does not mix, he stays by Chiropractic because it stayed by him. He realizes the only road to success is the hard way straight ahead.

Between these types are mixed breeds that spurt and slip, fight ahead today and grease backward tomorrow; who are up on toes for a while and slide down for a period; who move forward and backward steady by jerks, according to how lately somebody has jacked them up. They are not self-starters; they move only because they attended some meeting, heard somebody talk, which gave them a new shot in the arm and as long as it lasts, they last. When that wears out, they have run down.

For every thinker, there are 999 workers; for every employer there are 99 employed; for every worker, there are 9 drones in the hive. For every 9 men there is a fore-

man; for every 99 men, a superintendent; for every 999 men, a boss. **The conscientious, careful, competent chiropractor** is a necessity on the sick market. Find him and you will get well. Fail to find that fellow and as well throw your money to physicians, unless by the Grace of Innate an accident happens!

The principle of Chiropractic is established, fixed, permanent. That cannot be changed. The practice of Chiropractors is careful or careless in ratio as the person is careful or careless. If careful, he is a Chiropractor; if careless, he could be anything but that! Care must be exercised in selection of your "chiropractor" as you would be careful in selection of dentist, physician, surgeon, plumber, or any person whom you pay for services expected, desired, or demanded.

This book covers about 85,602 words. The original copy written and rewritten embraces 162,028 words. So it was boiled down from 247,630 to 85,602 words.

Books should be written only when something new need be said, or something old is stated in a new way; or some new and better service can be thus offered humanity. What is new or what can be better said must remain within the province of the thinking value of the one who writes the book. The interesting part about writing a book is that usually the author develops his methods or systems and then writes about them; or he writes about them as he develops those methods or systems. The aggravating part about developing methods and writing about them is that one idea leads to another as time enters his picture and he never knows when to cut off and print what he has written. This book has been in the writing over a year. The ideas

we are writing about are not finished. The book is not ready to be printed. Shall we cut just anywhere, without rhyme or reason, even tho subjects are not finished, methods and systems are still in the making; or, shall we hold the book back until the present line of research is completed, Just about the time the neurocalograph was completed and in working order, we figured that the book was ready for press; but just then another new method or system was given birth and we started work on it. It of right should also be in this book because it was a clinical research problem we were solving. Before we get thru, we may hold the book up until this idea is finished, but—who knows—by that time another may be in the making.

Somewhere in every organization some man sets the pace, establishes the desired objectives, who reaches forward to a staff to carry on. He is immediately followed by a small army of workers who develop his ideas in foundry, machine shop, carpenter shop, forms, molds, castings, paint shop; assemble them, try them out, see if they work, change them if they don't. When placed in laboratories, comes another small army of office experts, scientific men who develop tangible results on clinical cases, confer with men higher up, finally reaching back to the man at top. No one man conceives all ideas. The finished product might have been his in original conception, but every helper suggests additions, subtractions all along the line. The finished product with its equivalent service is a composite of many minds. To each of these, in the monumental work we set ourselves in The B. J. Palmer Chiropractic Clinic, we here and now give credit. Even tho many minds, some minds stand out as of greater importance than others. Drs. Remier, Sheeler, Heath, Coxon, A. B. and H. C. Hender,

Cronk, Edith Stoke, and Otto Schiernbeck we especially remember for their untiring aid in building our local scientific clinical work which this book has aimed to exemplify. In the field, primarily comes my nephew, Wm. P. Brownell, D. C., (Washington, D. C.) who was a pioneer in X-ray work, more particularly emphasizing stereoscopic phases; Al Wernsing, D. C. (Los Angeles, Calif.) who developed the orthoprotractor, a means of measuring spinographic sublaxations. And there are others who have aided in other phases. To enumerate them would be a pleasure if space permitted.

THE KNOWN MAN

DEFINING TERMS

If a healthy person could hold time static, wherein function was flowing at normal regularity of rhythmic speed, meeting all internal and external requirements, with no abnormal fluctuations, it could be said he was in a **constant** or healthy condition. No person is normal, therefore cannot be constant. Time goes on with its daily, hourly variations—losing youth, gaining age. Function fluctuates, in sickness, to abnormally attempt to meet internal and external demand and supply, no day, hour, minute being a standard unto itself. Healthy man is a variable, becoming infinitely more variable in sickness.

If the human form was born, built, and lived normal physically, if the flowing function within that human form was always normal in quantity and quality for the necessities of that form; if world outside of man was built and running with absolute regularity without fluctuations in quantity or quality of matter or function, then there could be no fluctuation in either towards each other, then it could be said that man was a constant as a composite unit of, and they would be in fact constants to each other. The external world, being a constant as a world, would not invade man and change his constant; neither would man react against the world with functions other than constant.

Patient goes to a Chiropractor with marked abnormal physical and functional variables, demanding he be re-established to that which is an approximate constant to

him. The sick person is surrounded with external normal variables which directly influence his internal abnormal variables and make them worse. It behooves the efficient, accurate, and competent Chiropractor to eradicate every external normal variable which influences every internal abnormal variable wherever and whenever possible, thereby establishing human constants as near as a constant can be established. In this way, the efficient Chiropractor builds and establishes a more nearly accurate fundamental for determination for calculations for restoring health.

SEQUENCE

The electro-cardiograph, recording sphygmomanometer, polygraph, Neurocalometer, etc., register and record actions and reactions of by-products. The mental and physical sequence of events, beginning at source and leading to the by-product, are:

1. Mental thought.
2. Mental impulse as a result of thought.
3. Mental impulse transmission as a result of continuity of mental impulses.
4. Emotion expressed in matter as a result of energy contracting matter.
5. Function expressed, such as respiration, pulsation, pressure, rhythm, heat, etc.

Two at internal source are important in leading to manner in which those two can be changed by external

variables which would change the constant of action or reaction in building a case record.

First, mental thought divides two ways: **Innate** (so-called "sub-conscious") mental thought, and **Educated** (so-called "conscious") mental thought. Innate mental thought can and does originate within itself, thus could and would control internal functions. Educated mental thought energy flows from Innate but its excitant afferently might originate external to itself, as in environment, and then would efferently effect external function. Innate mental thought is usually called emotion when effected from the external sense. Educated mental thought would be construed as environment and could be effected by emotional changes in the use of any of the ordinary senses such as sight, hearing, tasting, smelling, and feeling. (See Addenda 18 and 22.)

The second great objective is mental impulse continuity of nerve force quantity flow, for nerve impulse continuity has quantity as well as pressure per time element. According to time element of mental impulse flow of nerve force quantity and pressure, do we note manifestation at periphery in respiration, blood pressure, blood pulsation, nerve heat, etc. If mental impulse flow is interfered with in transmission, then its by-product will change action or reaction of by-product at periphery in abnormally changing respiration, blood pressure, blood pulsation, and heat, by increasing or decreasing any or all of them. Some may be up and others down the scale. Mental-impulse nerve-force flow, if "norm" has a free, steady, continuity. If mind is at ease with its body, body is at ease with its mind, there is balance between desire for action and action expressed. If intent and necessity as understood by mind in brain has

free transmission, without interruption or interference, demand will be met with supply. To have truthful question and lie answer is to have mental explosion, because you ask it to pervert itself, to change honesty to a lie which produces emotional complex. Interference interjection between source and expression creates conflict in transmission and causes pause, make and break hesitations in normal flow, break it up into irregular abnormal flow, followed by fluctuations in weak and strong pressure pauses; weak on ebbing out side, strong on incoming rush tide side—which register and record reactions to questions asked. These reactions can permanently and pathologically exist within, because of subluxation interferences generating internal variables; or they may be temporarily incited by external variables such as environmental influences.

Electro-cardiograph, recording sphygmomanometer, polygraph, etc., register pulsation and blood pressure, even in minute degrees. The Neurocalometer accurately registers interference to transmission of nerve force energy at source of resistance by measuring its by-product, heat. We cannot measure mental action or nerve force flow direct either in quantity, continuity, or pressure. Neither can we measure action in function direct as to whether normal, hyper-normal, or hypo-normal. But we can measure the by-product of increased or decreased pulsation, increased or decreased blood pressure, increased or decreased resistance heat. It is physiologically and psychologically sound that anything that externally disturbs Educated mental action internally, also sequentially disturb correspondingly the nerve force flow continuity in quantity and pressure, and thus correspondingly changes by-product. Correspondingly, anything that internally disturbs Innate nerve force flow continuity in quantity or pressure,

also sequentially disturbs action or reaction in function and thereby again changes by-products.

No record established by electro-cardiograph, sphygmomanometer, polygraph, or Neurocalograph, establishing a record of by-products, is of constant value unless all variables external to human body, are eliminated, leaving only internal variables to be measured. If, in trying to measure internal variable, we permit external variables to constantly change internal variable, then we register nothing accurate but external PLUS internal variables and we have no constant upon which to base and establish a record.

ISSUE CLEARLY STATED

A comparison will make my meaning more simple and clear: In a room is a temperature, record of which you wish to secure and establish. You place in room a recording thermometer. As temperature of room varies, either hot or cold, your recording thermometer records it, no matter how minute. It is admitted that temperature in room itself is not a constant; it is variable, and what you want is information of variability of that room. If room is completely isolated and insulated from all outside temperature-influencing factors, such as heat or cold outside room entering through walls, doors, windows, etc., then you will get actual variable-constant of temperature in that room. But, suppose every window, door, wall leaks and lets in hot or cold air from outside that room, temperature which vary more or less all the time, and then set recording thermometer in room—it is plain you will not and cannot, with any degree of accuracy, secure record of vari-

able-constant in room except as influenced and changed by external variables which have leaked into room, thus destroying all degree of accuracy in your record of variable temperature of room only.

If a person is externally emotionally excited or mentally stimulated, which approximately means the same, then internal nerve force flow continuity in quantity and pressure and sequential function at periphery of those nerves, plus by-product, would fluctuate and not be constant to be measured or recorded. (See Addendum No. 18.) For this reason, when we make an electro-cardiograph, recording sphygmomanometer, or polygraph record, we place person at ease, lying down, relaxed, with no external influence to reach the senses which might, could, or would stimulate or inhibit mental activities. In this way, whatever record we secure, we get the "norm" action and reaction without being subject to effects of external variables as they effect internal variables on constant we were trying to get. If, in trying to secure an electro-cardiograph, recording sphygmomanometer, or polygraph record, we placed case in an external electric or magnetic field, whereby internal nerve force continuity flow is stimulated or inhibited, then nerve force flow continuity as well as its by-products at periphery would fluctuate and not be constant. (See Addendum No. 21.)

That others have observed this external influencing factor is enhanced by the following quotation taken from "Directions for Installation and Operation of the Victor Electro-cardiograph", issued by the Victor X-ray Corporation: (See Addendum No. 1.)

OUR LABORATORIES ARE GROUNDED

To this end, The B. J. Palmer Chiropractic Clinic has builded electro - cardiograph, recording sphygmomanometer, polygraph and neurocalograph laboratories which are completely shielded and grounded. Floors, walls, ceilings, and doors are correctly and completely grounded, that any electric bombardment attempting to enter room would be immediately dissipated without reaching room or body of case on which a record of constant is being taken. (See Addendum No. 21.)

There is a constant discharge of radio bombardment in all air in all buildings everywhere, in homes or office buildings. Many radio stations are on many wave lengths, each of which as a variable is entering every home and room. There is also a constant leakage of commercial electricity off heavy voltage wires, off every electrical apparatus, off ordinary wires in an ordinary home, which bombards every human body, more or less of which is breaking through human skin insulation. It is an external variable and is artificially changing internal abnormal "norm" constant we try to read and get an accurate graph of. (See Addendum No. 21)

These shielded laboratories, then, give a mental force flow quietus where we have eliminated external mental emotional hazards, where emotional excitation cannot get through the senses of our case except those we want by-product reactions on. For same reason, shielded laboratories give a nerve force continuity flow quietus, where no external variable electrical excitation can get to our case except internal abnormal flow on which we want to build

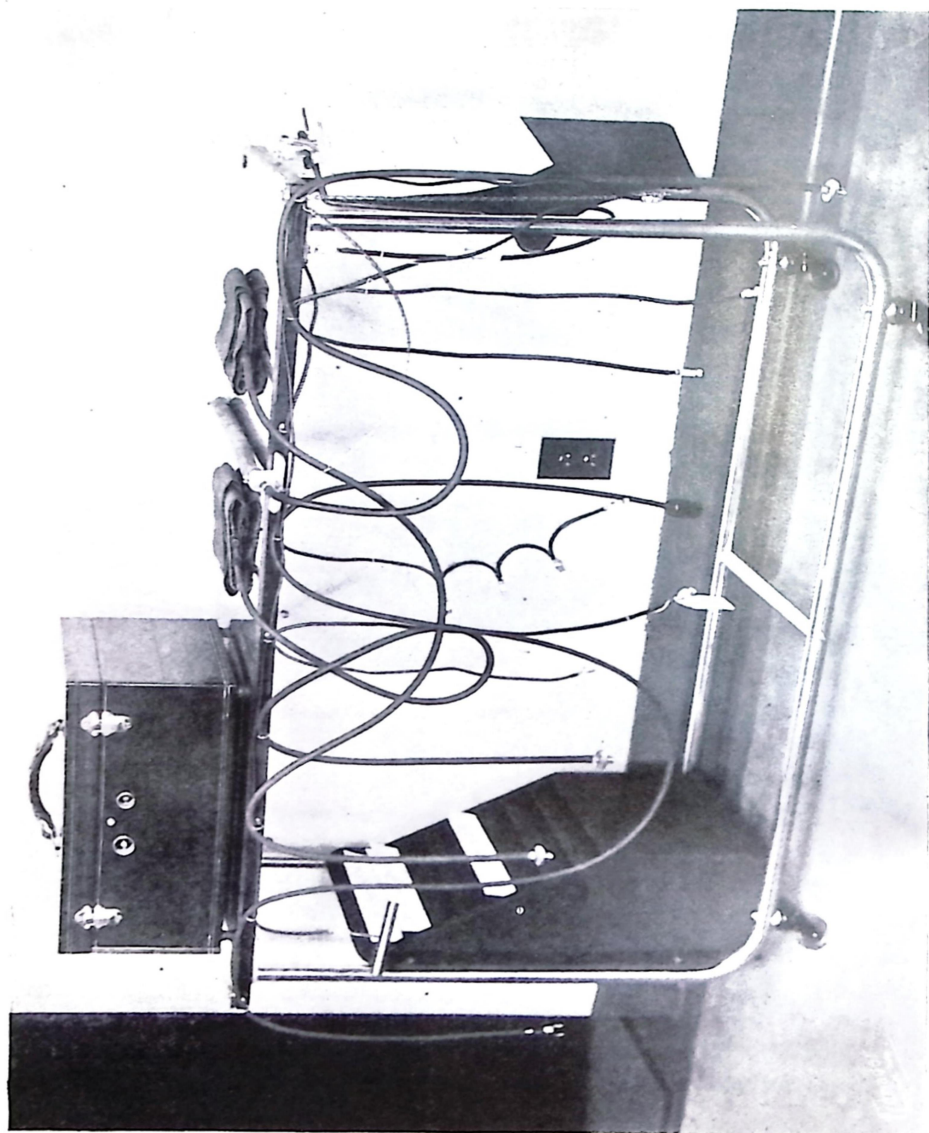


FIG. NO. 1

Keeler Polygraph, polygraph table, box for printed forms, etc., as used in The B. J. Palmer Chiropractic Clinic.

an abnormal "norm" record. In this way, we eliminate external variables and secure internal constants records.

THE POLYGRAPH

The Keeler Polygraph makes four graphs simultaneously, with four stili running on same recording paper. One records respiration, fast or slow, high or low. Two make a recording sphygmomanometer record of blood pulsation. This instrument is commonly known as the "lie detector." Suspect is seated in an ordinary room most anywhere, and bares left and right arms. Inflated bag is placed above elbow. A chest strap is placed around chest. I have seen this portion of test made with chest strap over clothing. This creates variables. It should be placed on bare chest, same as inflated bag is placed on bare arm. Instrument is run a minute or two to establish a "norm". Then suspect is asked two kinds of questions: first, ordinary questions, such as "Did you have breakfast?"; second, a line of questions such as "Did you kill Tommy?". First line of questions has nothing to do with crime which person is suspected of having committed. Second line is directly apropos to crime. Suspect is instructed to answer "Yes" or "No", and make no explanation until after test is completed. Theory is that if person is asked a direct obvious question and there is no emotional excitation, as would be true with a lie, then polygraph records "norm" in respiration and in pulsation. But if person is asked direct crime question and hesitates to frame the lie, emotion is aroused. This effects nerve force flow continuity by exciting or retarding it, also changing respiration, both of which changes are noted in irregular graph on polygraph record and are interpreted as "lies."

TECHNIQUE OF "LIE-DETECTION"

Suppose prisoner, having no choice, forced to submit to Keeler Polygraph tests, is sullen, stubborn, and refuses to answer questions. Case, not being deaf, hears questions. They penetrate to his mind. His conscious mind thinks truth or lie, same as though he had answered. Onward flow of mind-thought force to body is same as though he had spoken. Internal reaction which we register on polygraph comes from his mind to his nerves to that portion of body where sensitive registration is picked up. He thinks in his brain, he speaks with his mouth, but it is on the arm we pick up nerve-force flow reaction. Polygraph record is based on thought wave flow between brain and body, not on spoken words "yes" or "no". (See Addendum No. 22.) Silence secures its record as well as words, except that we who listen don't hear agreement or contradiction.

Keeler polygraph is so sensitive to registration of internal mental impulse nerve-force flow in regular or irregular actions and reactions, that contact between instrument parts and human body must be on bare flesh, not over or through clothing. As well try to palpate accurately for subluxations with fingers over underwear, shirt, vest, coat, etc., as to try to make sensitive polygraph recordings through clothing. Clothing has wrinkles, folds, and defeats sensitive nerve-force action wave flows, and benumbs polygraph sensitive pick-ups. With female cases, where registration of respiration is taken, with respirator over bare chest, we surround shielded and grounded Keeler polygraph reading booth from room with drawable curtains, which close off curious observation which introduces extraneous variables which disturb and upset equanimity

of truthful records. To have privacy, without embarrassment, excluding variables, is to make a more true "norm", placing advantage to case.

CARE IS EXERCISED

In one polygraph laboratory, where "lie-detection" work is pursued, the technique calls for eighty-five pounds air pressure inflation in inflated bag around arm. As it goes all around, this is equivalent to a tourniquet. In two or three minutes, arm is blue, feeling is numb, circulation of blood and mental impulse nerve-force supply are stopped. At eighty-five pounds air pressure, inflation is so great that activity sought to be measured is so paralyzed that it has been cut off. To relieve this condition, patient is released by deflating bags for a few minutes, then resumed again. Keeler polygraph seeks continuous graph record of deflections in flowing blood and nerve-force currents. To secure this, pressure must be low enough to permit blood and nerve forces to flow through pressure without distortion other than deflections which occur in case answering questions. If pressure is high, it prohibits blood and nerve forces flowing through pressure and creates forced distortion other than deflections which occur in case answering questions. Bag or bags must be inflated only sufficiently to get firm all-around-arm contact, without interfering with otherwise normal flow of blood and nerve-force mental impulse supply, the deflections of which you wish to register, destroying nothing you seek, making possible everything you desire. These minor details are so vital and obvious and overlooked that we often wonder how any laboratory worker could have overlooked them.



FIG. NO. 2

Keeler Polygraph as used. Dr. Palmer in foreground, Dr. Sheeler in background. Case lies on table to left.

1. Ground wires from polygraph to polygraph table.
2. Ground wires from polygraph table to wall-ground.
3. Ground wires from table-couch to wall-ground.
4. Ground wires from case to wall-ground.
5. Keeler Polygraph in completely-shielded and grounded room.
6. Record on recording sheet, making four simultaneous graphs.

Another reason for curtained-in booth is that vitally interested people concerned in outcome, standing immediately outside booth, looking in thru copper screens, would introduce foreign variables to case's mind which would distort "norm" and its constants which we demand to establish accurately the lie if there be such.

The Keeler Poly (many) graph (record) makes four simultaneous records:

1. Respiration—if full and free, short or hesitant, natural or forced, etc.
2. Nerve-force flow direct or blood flow irregularities.
3. Same as second taken at another sensitive reading spot. As to which of these two (nerve-force or blood flow) differences is interpreted, I lean to nerve-force direct, by preference.
4. A fourth graph record is made each time a question is asked, identifying location on graph of question with first three characteristic graphs.

FOUR SECTIONAL RECORD

Our Keeler Polygraph record is divided into four sections:

1st. The "norm". This is first section run after case has lain down, relaxed, and is at ease for about fifteen minutes preceding tests. We want case to not be excited, disturbed, or upset. We want him to be internally restful. (See Addendum No. 21.)

2nd. Second section consists of "obvious stock ques-

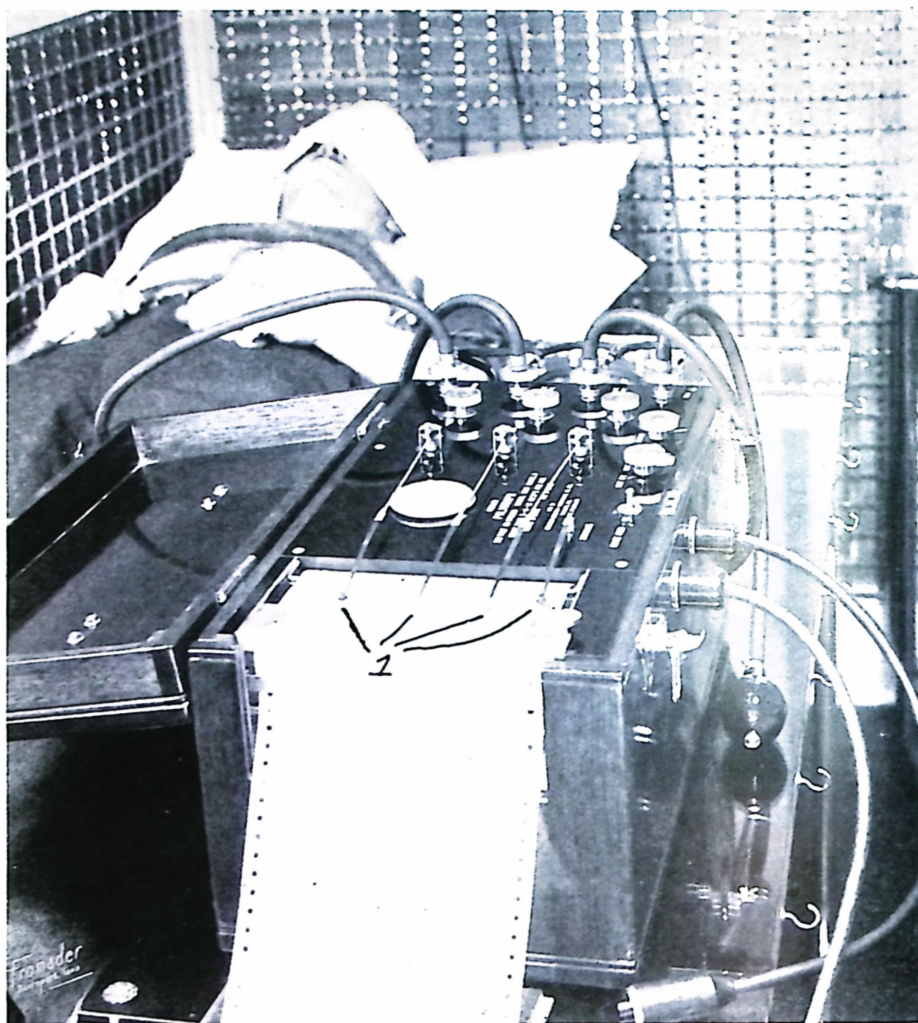


FIG. No. 3

Close-up of Keeler Polygraph used in The B. J. Palmer Chiropractic Clinic. Close-up reveals four styli used in making four simultaneous graphs.

tions" which are of such a type that truth is **natural** to answer "yes" or "no"; where nothing is gained by lying.

3rd. Third section consists of "obvious trick questions" wherein we ask case to **deliberately** lie to questions asked. In this way we **build contrast** into polygraph record between graph line of "obvious stock questions" and truth, and "obvious trick questions" and lies.

4th. Fourth section consists of direct and leading questions pertaining to crime under investigation. These are based on facts of crime; theories which sheriffs, prosecutors, attorneys, etc., may hold regarding how and who committed crime, etc. Questions are searching and seeking connection of this person with those facts, his answers affirming or denying, connecting or disconnecting himself with this crime by his honest or lying answers. (See Addendum No. 24.)

Fourth section is compared back to contrast between "norm" of first section, and whether fourth section agrees with honest graph record of second or third lie section.

All questions are asked by one person, operator of Keeler polygraph. They are asked in an even tenor, quiet manner, spoken in a soft kindly tone. In all tests done in the laboratories of The B. J. Palmer Chiropractic Clinic, we do not permit sheriffs, deputies, police, or chief to ask **any** question or questions. They have been trained to think of every man charged or suspiciously connected with a crime as guilty until he acquits himself, therefore their tone and manner of approach is to bull-doze, bluff, and "third-degree" their victims into an admission. To pursue such tactics with this exceedingly sensitive Keeler polygraph is to introduce external variables, excite and artifi-

cially stimulate or inhibit mental impulse nerve-force flow constant, produce a violently upset record, doing injustice to case. Accurate and honest test of reliability is to permit every advantage to accrue to case permitting a contrast if there be any hidden inside his mind. The human equation is a situation where action must come from case within to without. All operator can do is suggest a question under most favorable conditions to case, directing itself to a certain fact. Case then thinks answer, polygraph recording action of that, be it as it is. Dominating methods defeat purpose of "lie-detector" and produce a record which deceives itself, not the case or the crime as well as truth or lie. What polygraph records is action of case from within, rather than a bull-dozed stimulated or inhibited reaction from without.

All original records made by and with the Keeler Polygraph remain as the property of The B. J. Palmer Chiropractic Clinic and are and will be filed under the case file under consideration. Direct nature of record prohibits duplicates or carbons of original graph. We make carbons of interpretations of graph which will be furnished to interested parties upon showing cause why they should be given copies.

WHY ONLY "YES" AND "NO"

There are reasons why we purposely frame every question so it must be answered "yes" or "no." Case is advised at beginning of tests to answer only "yes" or "no" to questions. Later, if he cares to offer explanations he may, when tests are over. If question is asked and he hesitates before answering "no" it is because he thought truth "yes" and

spoke lie "no." If question asked is answered "yes" promptly, it shows no hesitation in stating truth. If question were asked and he were permitted to give explanations, it would permit his mind time to frame an evasion. Court attaches know too well the doubt of credibility placed upon any witness who drags time between question and answer.

In The B. J. Palmer Chiropractic Clinic our Keeler polygraph "lie-detector" laboratory research, we have carefully grounded everything which might be influenced by ionization of electrical disturbances, changing normal records to abnormal ones, no matter how slight. Minute differences make difference between accuracy and inaccuracy:

1. Room is accurately and completely grounded.
2. Operator stands on rubber mat on floor.
3. Operator need not be grounded as everything he contacts is.
4. Keeler polygraph is grounded to table-stand it rests on.
5. Table-stand Keeler polygraph is on, is grounded to room wall.
6. Table-couch on which case lies is grounded to room wall.
7. Body of case is grounded from his hand to room wall.
8. With these efficient checks keeping out external variables, Keeler polygraph records **only** mental-impulse nerve-force constant as it changes in flow coming from brain to body of case, which varies ac-

according to questions asked and answers thot by him.
(See Addendum No. 21).

WORK DONE ONLY HERE

Obviously, all Keeler polygraph record "lie-detector" work done here must be done in our laboratories. Cases must come here or be brot here. From what is herein laid down, it is clear that it is our scientific opinion that accurate, efficient, and reliable work could not be done outside of a shieded or grounded laboratory. We could secure a record any place; but to get an honest record is objective sought. This idea of traveling from city to city, taking instrument to suspect rather than suspect to laboratory, has a psychological value; one that increases the mental hazard of suspect. Such does not eliminate external variable factors which frustrate accurate, efficient, and competent records from which interpretations are made. Which is a better procedure, may be debatable: (a) take instrument to suspect, increase external variable hazards, decrease accuracy standard to increase mental hazard; or, (b) bring suspect to laboratory, increase internal constant efficiency, increase accuracy standard, to increase mental hazard based on facts which he knows are true.

Public thinks use of Keeler polygraph "lie-detector" is for purpose of "subconsciously" psychologically wringing a confession from a criminal who will not otherwise reveal truth which public officials seek to fasten on a certain individual, or get from him if guilty, or become reasonably convinced this party is innocent. This instrument has a thousand private applications where private tests are made for private situations, such as banks checking regularly all

employees who are in position of honesty and responsibility. Tests made in our laboratories are strictly private where it is desired, no information "leaking out" no matter how spectacular the situation demanding investigation or how important private situation may be where privacy is vital. Other conditions arise where publicity is desired to attain desired objective.

TERMS OFTEN MISNOMERS

The term "lie-detector" is a misnomer because Keeler Polygraph does not detect lies any more than truth. Keeler Polygraph is a sensitive instrument which records internal variations of actions of another to an external question asked. Record is then interpreted according to what it indicates by comparison in contrasts. Mother or father asks child direct questions regarding certain circumstances. Child fidgets, blushes, stammers, hesitates, refuses to look parent in eye, etc. You interpret these as evidences of not telling truth, whole truth, and nothing but the truth. An attorney asks witness questions regarding definite issue in court. Witness squirms, hesitates, stalls, makes statement, retracts, etc. Court learns to interpret these as evidences of not telling truth, whole truth, and nothing but truth. Intangibles cannot be put down in shorthand "in the record," but all are as important to eliciting truth or lies as words spoken and written down in short-hand and later transcribed in long-hand. Same is true with use of Keeler Polygraph. Questions are asked. Case answers. Betwixt and between question and answer are case's mental thots and nerve-force flow to his body with its fidgets, blushes, stammers, hesitations, squirming, stalling, all being matters

of record on graph. Difference between this "evidence" and that taken in court is: in court, intangibles are not and cannot be recorded; with Keeler Polygraph, they not only can be but are recorded.

WHEN TO DETECT

If human being was attached to electrocardiograph, sphygmomanometer, polygraph, neurocalograph, etc., during sleep when Innate mind (so-called "sub-conscious") is awake, actively flowing in all that body, and when Educated mind (so-called "conscious") is asleep and is not present; and if it were possible to then talk to Innate mind (the so-called "sub-conscious") and ask it questions, answered reactions would speak **only truth**. These instruments would be in fact **truth-recorders**. (It is a question in mind of writer that the most efficient method of taking "norm" record is during sleep when there is no contrast or conflict present.) (See Addendum No. 18.) Innate mind knows **only truth**, thinks **only truth**, would react **only truth** as a by-product on instruments which record by-products.

Innate brain is, generally, a constant and can be relied upon to act as a constant in balancing bodily function if its product can get thru to body. Body function is, always, a variable because of Innate brain constant not being able to get its product thru to body. Vertebral subluxation, between Innate brain and body is the **primary cause** of change from brain constant to body variable, creating a contrast and conflict in, over, and thru efferent and afferent nerve force flow, from normal to abnormal. If it were possible to record, by any now known means, the Innate brain product direct, and body by-product direct, at epiphery and periphery, one would be found constant and other

a fluctuating variable. (See Addendum No. 18.) Were there no constant, there would be no God in the Universe; no "Nature", *vis medicatrix naturae*; no getting well sick human bodies.

If a human being was attached to electrocardiograph, sphygmomanometer, polygraph, neuro-calometer, etc., during waking hours when Innate mind (so-called "sub-conscious") is awake and active in all that body, and when Educated mind (so-called "conscious") is awake and is present; and, it being possible to and we do talk questions and answers to Educated mind (so-called "conscious") reactions thereto record difference between truth function of innate mind reaction and the lie-desire, intent and deception purposely thought out by Educated mind. These instruments then would be in fact lie-detectors. Innate mind knows only truth, thinks only truth, would react only truth as a by-product whereas Educated mind desires the lie, thinks the lie, and contrast between truth flow of innate mind and lie flow of Educated mind produces by-product of difference between "norm" and "abnormal" in comparative reactions. (See Addendum No. 21.)

"Truth" and "lie" are comparative and exist only as they contrast and conflict with each other. Innate flow reaction to a question would react to truth whereas Educated lie-desire flow reaction to a question would contrast and conflict with former, making a contrasty and conflicting record which would be watched for and interpreted as "a lie." The "lie" is the contrast and conflict between two flows, one variable artificially designed to evade truth, and the other constant natural flow that evades nothing.

To speak truth is natural, is spontaneous, requires a short memory. To speak a lie is artificial and manufactured, is a hesitation and requires a long memory to recall, to try to be consistent. The polygraph graphs interval of time between spontaneity and hesitation, between normal depth of "norm" and abnormal depth of the lie, records which are easily interpreted. It is bucking one mind against other mind, conscience-personality against Education-personality, natural conclusion against artificial, internal against external, substance against its shadow, fact against evasion, which produces irregularity or confusion that manifests itself on chart which is interpreted as "a lie." (See Addendum No. 2.)

WHERE TO DETECT

I am not concerned in recounting action of polygraph except to point out one salient angle: preliminary tests are taken most anywhere, at any time, under ordinary conditions. I have seen tests made with a woman as a suspect, where six men were in room; taken where there was no shielding of any kind, such as in a court house, court room, city or county jail, or sheriff's office. Under such conditions, outside emotional influence of additional persons does change the "norm" emotional by-product. In a building where there is a variable electrical bombardment, it would change nerve force flow continuity by breaking thru skin insulation and stimulating or inhibiting it, and by-product would not be true to "norm" record sought. "Norm" taken anywhere, regardless, is not an accurate "norm" to that person. Take the same person and his "norm" in different parts of a city; an office building, a home in suburbs; near

an electric plant, etc., and "norm" will change from place to place. Eliminate all but two people (suspect and operator) and you will get one "norm"; add a dozen people facing case and "norm" will vary.

(That the particular University does send men out to secure records under conditions stated is true. Am of impression that this is preliminary to culling process between impossible and possible suspects. After gaining "possible" they are removed to University where I hope shielded and grounded rooms are equipped to do accurate work.)

"Norm" itself is subject to variables. Each sick person has a "sick norm" which varies as sickness runs up and down scale of degree, frequency, etc. A female period would establish different "norm" than on days when menstruation is not present. It would not be a constant to take a periodic day "norm" as the "norm" for average of her month. A headache today and none tomorrow would establish two different "norms." A headache "norm" occurring one day a month in a male could not be a constant to calculate "norm" for other 29 days of month. External environments establish an environmental "norm." Some variables can be eliminated and should be, in fairness to constant one must secure to act as basic factor from which to study fluctuating nerve force rhythmic flow abnormalities.

STUDYING THE THIEF

In our research studying mental impulse nerve-force flow, its constants and variables, by-products and recording its records, it was but a step from nerve-force, to heat, to NCM measurement; from nerve-force to electrocardio-

graph; from other methods of recording variances in transmission of human energies, to the Keeler polygraph and its lie detection. Fundamental is the same. Polygraph is a nerve-force recording instrument, reading, checking and recording constants and variables. We have been, are and will be more directly interested from now on, in crime detection, whether it be an external murder or an internal mental impulse thief. Study and research of mental impulse nerve-force flow and recording same is directly within our Chiropractic principle and practice because it is pressure, interference, resistance to it which has to do with man, sick and getting well, subluxation and adjustment; crime, its detection, and correction from within.

CRIME IS SICKNESS

Crime is a variable act, or series of them, which is normal function perverted from constant; it is normal quantity of power interfered with producing an abnormal function. It is no different than any other dis-eased function. Crime is both mental and/or physical. It should be our obligation to society to locate cause of dis-eased, mental, or physical crime, adjust it, restore the constant or normal quantity mental impulse nerve-force flow to reestablish normal quantity of physical function and normal quality of mental function, same as we would think of society as a group of well and healthy brains and bodies. Dis-ease parallels quantity of mental impulse supply which is interfered with. Crime parallels same cause, same way. I hope to be able to show, sooner or later, records of those accused of "crime;" perhaps his conviction and branded a criminal; and then give adjustments, the changed record to prove

that "crime" is a stigma attached to a sick man who needs adjustment more than punishment; that "crime" is dis-ease as much as asthma; that "crime" has cause which changes constant within to a variable without, same as the cause of constipation. Records of "criminals" will be little different than those of so-called respectable honest people of society. The difference, if there be one, is that one is in, the other out; each thinks same thoughts, desires to do same thing. One does it, other fears to do so; one bursts forth in uncontrolled expression, other suppresses what he might like to do. So far as the inner mental impulse nerve-force flow abnormal urge is concerned, the "lie detector" shows them running true to form. Same emotions, passions, and prejudices flow thru impulses of one as other; one more normally curbs, other gives wider swing to abnormal expression; one is caught, other isn't; one is convicted, other goes free. To be branded consists in catching one, convicting him at any cost, punishing him by physical incarceration, taking away opportunity for his body duplicating same act twice. Crime detection is little different than dis-ease detection. Seeking cause of dis-ease means to locate, detect, and correct pathology which includes crime.

Crime and sickness are financial drains on public purse; leeches or blood-suckers on productive usefulness. Criminals and sick people are destructive because they require housing, feeding, nursing, doctoring without being productive. With cause detected in either or both, cause can be corrected and both groups turned back into society as productive units. They not only will then produce, but they will reduce overhead cost of non-production. (See "Problems" by Dr. Palmer for further discussion of this problem of society).

HOW TO DETECT

Polygraph records should be made in a laboratory properly equipped and thoroly shielded, placing every advantage to benefit of suspect. And, peculiarly, in placing all advantages to furtherance of interests of suspect, you are automatically and at once placing **every** advantage for truth to his benefit, and every advantage of a lie to his disadvantage. For these reasons, cases where abnormal nerve force flow is measured, or criminal suspects are recorded for truth or lies, should not have final records made except in laboratory properly equipped and thoroly shielded, and thus only would a 100% perfect, reliable, or accurate record of facts desired be obtained.

We have made tests of electrocardiograph, recording sphygmomanometer, polygraph, neurocalograph, etc., outside of shielded and grounded laboratory, as well as in one properly shielded and grounded, on same case, as near simultaneously as possible, and there has been a marked difference in two records. We have also made tests of electrocardiograph, recording sphygmomanometer, polygraph, neurocalograph, etc., by placing pathology case or criminal suspect outside range, as well as within range of a strong electrical discharge bombardment, and again two records are of sufficient dissimilarity that you would hardly believe they were of same person. This is proof of accuracy of one avenue of approach and inaccuracy of other.

Man is a complete electrical unit, first made, crudely imitated but never duplicated. His brain is a dynamo that absorbs, condenses, and concentrates something out of ether which we call life. Nerves are efferent and afferent

equal to positive and negative wires. Muscles are motors which move and, moving, create certain by-products we call heat, digestion, assimilation, secretion, excretion, reparation, etc. Skin is a three-layer insulation to keep inside currents from leaking out and to try to keep external currents from getting in and affecting the inside currents. Mental impulse is created in the brain. It is there impregnated with intelligence. It leaves brain and passes thru nerves, arriving at muscles or other tissues there to perform an action. It leaves brain directed; it travels thru nerves with intention; it arrives and performs function. This intelligent human electrical current, following from brain to body and body to brain, is so minute in quantity that it has never been directly measured. It can be disturbed in quantity flow by factors such as vertebral subluxation or external quantities of commercial current. It is these factors which vary the constant that require research, both of which problems we have delved into, perhaps more practically now than before. (See Addenda No. 15 and No. 23).

"NORM"

There can be only three relative quantities of rhythmic nerve force flow, two being subject to endless computations above or below "norm" level, viz., first, the "norm," level or par; second, too much, or above "norm"; third, too little, or below "norm." "Norm" exists when there is a steady healthy natural rhythmic nerve force flow which has not been tampered or interfered with by anything internal such as vertebral subluxation, which is able to meet with and can naturally adapt and adopt all natural external energy

circumstances, which is not in conflict with anything external such as electrical variables, etc. One purpose of this book is to set a standard understanding of "norm," but the main problem nevertheless is sickness.

The Neurocalometer reads **by-product** of nerve current resistance—heat. Neurocalograph reads by-product of nerve force continuity, endeavoring to pass through an occluded opening with pressure upon nerve inhibiting that flow, which produces an excess work with its by-product—heat. (See Addendum No. 16). If nerve force flow continuity is subject to same sinister influence of external variables, it is obvious that in our every-day Neurocalometer readings, regardless of whether it be home or office building, small town or city, bombarded as that office is with multiple radio wave lengths and constant electrical discharges from electrical equipment in that home or in the air, breaking through skin insulation, we are not accurately reading nerve force "norm" constant except as stimulated or inhibited by external variables. If body of NCM technician can and does act as an antenna and if, in reading, his hand is in contact with forehead of patient, and if his feet are in contact with bare floor which often acts as a ground to reception of external variable electrical disturbances, then all this influences abnormal readings. How far are mean lines changed by increasing or decreasing, or by switching from L to R, or R to L of median line by these variable factors, from day to day, as case is pre-checked? We might make wrong readings and give adjustment when we should not, or would not when we should—no fault being attached to case or NCM technician, both having their work changed by external variables which change internal constant or an internal constant or an in-

ternal variable, which from hour to hour or day to day would not be alike or constant. One most important variable which can best be eliminated is the "environmental variable" by grounding or shielding your pre and post check NCM readings.

Lightning kills many people; electricity of smaller degree paralyzes others (what is electrocution?), and still smaller quantities will contracture muscles and produce vertebral subluxations until finally it will fade down to playful penny-in-the-slot quantity, but eventually it dwindles until the quantity breaking thru insulation is so small that even we do not notice it; yet it is affecting the natural, onward, even flow of nerve force continuity.

CONSTANTS AND VARIABLES

A modern simple example of a constant and variable exists in every high-fidelity radio broadcasting transmitter which has a wave-length constant which is so perfectly balanced on its frequency that exactly the same constant leaves antenna during the time they are on the air. They are authorized to broadcast within a band of 10 kilocycles and seldom does one vary more than two cycles out of millions. If they broaden beyond ten kilocycles, it heterodynes with some other station and produces squealing. Whether it be a 100-watt or 500,000 watt, its frequency is fixed. Federal Communications Commission sets this standard and checks to see it is maintained. Ordinarily, transmitter injects into air more electricity than air contains, in which event air carries its charge to remote places. During storms, bolts of lightning exist in which air contains a heavier

charge of local lightning electricity than transmitter can feed into air. Instead of transmitter pushing into a lighter load of air, heavily loaded air pushes into a lighter load of transmitter. Transmitter antenna absorbs this excess load from air, follows it in on antenna lead, into transmitter set, automatically shuts off internal constant feed, grounds external variable feed for the moment, until that charge is discharged; thus transmitter is saved from damage, and interruption, while it exists, is momentary. After this, transmitter gets back to its constant and again gives off more than air contains. A meter interjected into transmitter circuit would prove heavy additional load of external variable over ordinary load it effects.

Another simple modern example of a constant and variable exists in a long distance radio receiving set in your home. A high-fidelity receiving set, correctly tuned, picks up exactly the center of that constant given off by transmitter, and voice, music, etc., come in perfectly. Oftentimes static exists, in which atmospheric air is electrically disturbed, full of contrasting and conflicting variables of excess energy. Your home antenna picks up not only transmitter constant but also excess electric variables, and you hear voice, music, etc., coming thru with static, neither being clear and both existing confused. (We apply this fact to our problem under Test Nine.)

WEATHER AFFECTS NCM CONSTANTS

Where there is heavy electrical bombardment from air, it can be said that "weather" affects NCM readings. On days when static is heavy and seriously affects radio re-

ception because air is surcharged with electricity, our bodies are more affected by electrified bombardments and thus influence sensitive nerve force flow which affects NCM readings. A like condition is noted when electrical storms and lightning prevail. Reverse is equally true. In our laboratories, working on cases making NCM readings, we checked weather against readings and find it makes a change. Specifically speaking, what is the change that "weather" affects? If a subluxation exists with pressure and interference, then break readings with their heat would be observable regardless of weather. But if air is surcharged with electricity and break reading exists, then reading is variable and is not constant; it could fluctuate in quantity as nerve force flow is "excited" by external bombardment breaking thru skin insulation changing its regularity of rhythmic flow. If air is not surcharged with electricity and break reading exists, reading might not be variable and could be constant; it will not fluctuate in quantity as nerve force flow is not "excited" by external bombardment breaking thru skin insulation and thus does not change regularity of rhythmic flow. If it were possible to try to locate a "reading" at moment of a bolt of lightning, probabilities are that for the moment there might be a high reading, but it would be gone the moment lightning is over and nerve force flow had settled back to normal regularity of rhythmic flow. In our daily clinic work, without shielding or grounding cases, we could almost approximate outside weather as regards electrical content. To establish, therefore, a constant of reading based on normal regularity of rhythmic flow, not influenced by any external influencing variables, is another reason for building grounded or shielded NCM reading room. (See Test Nine.) (See Illustrations 4 and 5.)

MANIFESTATIONS OF ELECTRICITY

Checking into manifestations of electricity, we find substances can be electrified by rubbing, as glass rods, hard rubber, amber, etc. The property is not only imparted by rubbing, but may be transferred from one body to another by contact. If two similar bodies are charged in same way, these bodies will repel each other, while if they are charged in different ways, they will attract each other. This leads to two kinds of electrification which for convenience are called positive and negative electricity. A positive or negative charge can be placed upon any insulated body and the rule, "Like charges repel, and unlike charges attract each other", holds. The rule refers to a property of electricity, not to bodies which are charged. This is true in all cases where electric charge is at rest on the body (static electricity). If two bodies are charged with electricity so that one is charged more than other, and they are brought into contact, some of charge of one possessing greater amount will pass to one possessing lesser amount. Flow of current from one body to other continues until equilibrium between two electrified bodies is attained. Reason for this flow of current is: If a body of a certain size is charged with a certain amount of electricity, and another body of same size is charged with a greater amount, it is obvious that there will be a greater pressure in second body than in first. This electrical pressure is called electrical potential of charged body, and difference between potentials of two bodies causes flow of current from one to other. Current flows from body to higher potential to one of lower potential, and continues

to flow until potentials of two charged bodies have become equal.

Question arises regarding intellectual adaptation between centripetal and centrifugal, inside against outside, hub against rim, battle of man with or against environmental elements for existence, law of survival of fittest, etc. I have written much on this (in other books) which is named "the law of intellectual adaptation." Normal man adopts and adapts himself readily and without difficulty to normal air, water, food, gases, heat and cold, etc. It is this intellectual manner of normally adapting itself to normal things that mean a normal manner of existing life in the unit. To accept, adapt, and adopt within reasonable limits, is natural. To repel, resist, and deny entrance within excessive quantities is also natural. It is not those things we emphasize in this paper. Man, today, in city or country, does not live under natural conditions. He is forced to exist under artificial energetic conditions. One must adopt and adapt one energy to the other. If man were internally normal and elements were externally natural, there would be no variables; all would be constant. What we deal with here is an internal abnormal pathological condition (because of vertebral subluxations) in man trying to intellectually adapt itself to an external artificial manufactured environment outside of man, both being variables within themselves and to each other. Now that we have radio waves and commercial electricity, we build cabinets to exclude them to shield man against them; not in a therapeutic, treating, or curative value as that comes from within man, but to eliminate external artificial variables only so far as ascertaining the constants of man, in facts and records, to gain knowledge; to know what,

where, when, and how to do those things at those places which release that normal flow from within, so he can get well. (See Addendum No. 3.)

I am not at this time raising question of intricacies of what this means; neither am I going to discuss mistakes any or all of us have made in years past without this knowledge. Neither can fault be attached to any person for mistakes made. Principle of nerve pressure interference with its by-product heat is sound. Dr. T. K. A. Mapp puts it well when he says: "Many kinds of forces can be obstructed, and thereby prevented from reaching their objectives. Lead will obstruct the passage of X-Rays; asbestos will cut off heat; rubber will affect the passage of electricity, and pressure on a garden hose will reduce the flow of water. The flow of the neuro-electrical mental impulse force can also be reduced or obstructed by pressure upon the conducting nerves. The by-product of such constriction is heat, a fact which inspired the invention of a scientific instrument—the Neurocalometer—to detect and measure it."

Principle of Neurocalometer nerve heat reading by-product of nerve pressure resistance is sound. (See Addendum No. 16). Principle of giving adjustment when reading is found, and giving no adjustment when reading is not found, is sound.

That until this day we did not know that internal reading which we thought was a "norm" was not a "norm", is a new scientific research insight into our problem. That we did not know that external variables, such as emotional excitations of radiations or electrical bombardment variables were changing our readings, was not known.

EXTERNAL STIMULATION INTERNAL INHIBITION

Today we know those items **stimulate readings** as much as the taking of drug sedatives, hypnotics, and narcotics will **inhibit readings**. If case takes aspirin to deaden pain, he paralyzes the afferent flow of mental impulse continuity, and readings which might otherwise be present are for the day or two suppressed, and cannot be accurately recorded. Just as we instruct our cases in The B. J. Palmer Chiropractic Clinic to cease taking sedatives, hypnotics, and narcotics which **inhibit efferent continuity nerve force flow constant**, so also must we face this problem of external electrical variables which **stimulate abnormal internal "norm" nerve force flow constant**. (See Addendum No. 19.)

We have made Neurocalometer test readings outside of our shielded and grounded laboratories and then read same case, same NCM, same place, as near same time as stepping from outside not shielded to inside of shielded laboratory could make it, and have secured different readings. We have repeated this test on a sufficiently large number of cases over a sufficient length of time to satisfy ourselves that readings taken in laboratory are more accurate and more constant readings.

EVERYTHING IS GROUNDED

Four things must be shielded or grounded against external variables: 1st, the instrument; 2nd, the patient; 3rd, the technician; 4th, the room. In Addendum No. 1, manufacturers of electrocardiograph have grounded instrument.



FIG. No. 4

Shielded and grounded NCM reading booth in The B. J. Palmer Chiropractic Clinic. Size $8\frac{1}{2}$ ft. square. Shielded and grounded against radio, electric, Hertzian, as well as magnetic North to South Pole waves. Ceiling, all side-walls, floor under linoleum, door, etc., are completely grounded. This photo is the first stage in complete construction. Exterior view. See other photos also.

They ignore necessity of grounding patient, operator, and room. What matters it that instrument is grounded if patient and operator contain external variable and transfer them to instrument? What matters it if instrument and patient are grounded if operator expels an external variable from his body to patient's body and thus records a wrong constant? What matters it if all else is shielded and grounded if NCM is charged with static and produces an unnatural reading? (See Illustrations 4 and 5.)

To protect patient's constant, in our grounded and shielded labs, we ground instrument (beyond its internal grounding), ground tables on which patient lies, insulate operator with rubber matting on floor and rubber gloves on hands, and shield entire room. Same precautions are as vital to ascertain NCM constants. Four things must be shielded or grounded against external variables: 1st, NCM; 2nd, patient; 3rd, technician; 4th, room. To protect patient's constant, in our grounded and shielded NCM reading booth, we ground the NCMs to wall ground of booth, discharging static that may be in instrument; patient is sitting above a floor that is shielded and over a rubber mat, and technician works with rubber gloves. Even after building booth, we introduced an electric light in the center of booth overhead. The two electrically charged end wires leading in to feed globe, and itself giving off light, both radiated electrical energy into the booth. These were shielded.

TESTS FOR PROOF OF GROUNDING AND SHIELDING OF LABORATORIES

The building in which The B. J. Palmer Chiropractic Clinic is located is reinforced concrete, fire-proof, of latest



FIG. No. 5

Shielded and grounded NCM reading booth in The B. J. Palmer Chiropractic Clinic. Close-up, looking into booth with door open. Shielded and grounded against radio, electric, and Hertzian waves, but not as yet grounded or shielded against North to South Pole magnetic waves. Note light above shielded also.

construction requirements. Clinic is located directly under one of two antennae of Radio Station WOC with 250 watts day-time and 100 watts night-time power. This distribution of power on and in building, grounded as antennae are, acts as an additional hazard which few ordinary buildings could have, and thereby increases requirements of shielding and grounding above those of ordinary necessity in usual office in home, or usual office building. All wiring in Clinic building is in conduit of b-x. Floors are mastic which is a heavy conductor of electricity, especially if damp.

TEST ONE

Given two rooms alongside each other, one with shielding and grounding, other without; introducing theory that purpose of shielding and grounding one and not other was to eliminate electrical discharges in room shielded and grounded, leaving electrical disturbances present in room not shielded and grounded. (See Addendum No. 3.)

TEST TWO

An ordinary radio set, fed by city current electricity, was tested in Internes' Room about 75 feet from shielded and grounded labs. It picked up reception perfectly. With dial volume remaining set, it was moved to unshielded and ungrounded hallway outside of shielded and grounded labs. No reception was possible in hallway on this set. At same setting, radio reception also dead in shielded and grounded labs.

TEST THREE

Another radio, fed by city current electricity, was set in hallway outside of shielded and grounded labs. It picked up perfect reception. At same setting, set was moved into shielded and grounded labs, using same length antenna. Picked up same volume inside as outside. This would appear as tho labs were **not** shielded or grounded. We reasoned that reception was coming from wired-wireless, i. e., radio reception was being fed thru electric wires feeding electricity to radio set.

TEST FOUR

We secured a long distance as well as foreign receiving **battery fed** set. Radio was placed in hallway outside of shielded and grounded labs. Reception was strong on local and distance Stations. Leaving dial set the same, it was tested for directional value. Strongest reception was secured with radio facing North. With face of set facing North and leaving dials at same reception setting, it was removed to shielded and grounded labs, taking advantage of directional value. Two people were in room. Receiving set was absolutely dead. We then increased volume to maximum and it was still dead. This explains why all electrocardiographs are **battery fed** rather than city-current-electricity fed.

TEST FIVE

Still in shielded and grounded lab. With radio at fullest capacity, we used one human body as antenna contact-

ing human body to antenna wire on radio receiving set. Music came in some, but not to any extent. Multiplying two bodies to antenna did not increase volume of radio reception. This test proved that Test Three was produced by wired-wireless. It proved that human body could act as antenna and did affect radio reception even in shielded and grounded room. One conclusion is obvious: grounded floor shielding which is under battleship linoleum on floor can be made to act as a ground antenna when body of person is used as antenna in contact with receiving set. This brings forth: First, all recording instruments must be shielded from floor when in use. To this end, rubber casters are used on tables and instruments in these rooms. Second, operator of any instrument must not be in skin to skin contact with body of patient or that of instrument at time used, to prevent body of either patient or operator acting as antenna which would negative shielding or grounding of laboratory. NCM technician should work on rubber mat in shielded and grounded lab, with rubber glove on hand which contacts forehead of patient, to insulate himself from ground as well as from patient, and thus prevent his body acting as antenna and thus change value of reading.

TEST SIX

Leaving battery-fed radio set at same setting as tested in shielded and grounded lab, door was opened and some—but not much—radio reception came thru. Radio set was picked up and in ratio as it approached open door, leaving shielded and grounded lab, music began to thunder in at full capacity. This test proved that shielded and grounded labs were fully and thoroly shielded and

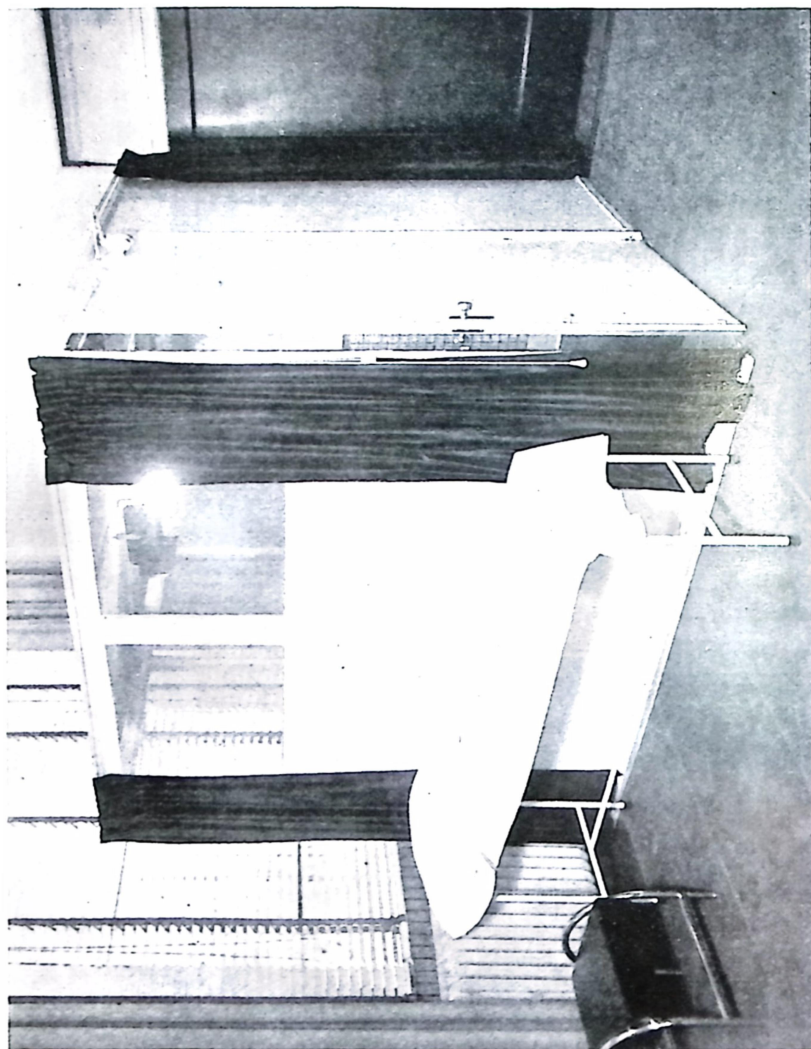


FIG. No. 6

Shielded and grounded NCM and Keeler Polygraph booth as used in The B. J. Palmer Chiropractic Clinic. The booth is used daily for all NCM reading of cases, and used occasionally for Keeler Polygraph criminal cases as a "lie detector". The photo portrays it as completely shielded and grounded against all waves. Iron sheeting covers OUTSIDE of booth. Copper shielding is INSIDE of booth. (See description in book).

grounded and that electrical energy **was** in outside air and that it did affect and work thru human bodies.

TEST SEVEN

The Cardiographer found, when standing on bare floor, with bare hands, if he touched any metal parts of these sensitive recording instruments, instrument would go ga-ga. This called for rubber mat to insulate him from ground of floor and rubber gloves to insulate him from contact with patient, after which contact did not change normal activity of instrument.

TEST EIGHT

After building and installing NCM shielded and grounded reading booth, all cases in The B. J. Palmer Chiropractic Clinic were daily pre-checked in it instead of outside in open electrically-charged atmosphere as heretofore. Since this Clinic was opened (Aug. 4, 1935) we have realized that to merely list a reading as "1 pt. R," or "1½ pt. L," was insufficient to reveal facts, and was incomplete to establish a record for retrospection of information revealed by daily readings. We established a new daily record sheet making possible a **graph reading** of mean line heat readings as well as breaks, if any. The chart had a medium line. To R and L were divided spaces from 1 to 10. Spaces were ruled from above downward, from occiput to 7th cervical. As each reading was made, a graph was established of degrees from 7th cervical to occiput, whether I or R; the degrees, whether mean line or breaks,

and each location of such. This established degrees the graph followed. This has been kept and filed, day by day, case by case. We therefore have before us a visual daily, weekly, or monthly basic record before shielding and grounding to now compare with after shielding and grounding. We not only have records of a group of cases before transition which we now compare with records of a group of cases since transition, but also have a group who were here during that transition where we can compare group readings in same cases before shielding as well as group readings on same cases after shielding.

We note the following general change in accuracy and efficiency of readings:

1st. A leveling out of all stimulated high mean line heat readings.

2nd. No increase in the low mean line heat readings.

3rd. A more marked series of breaks, standing out more distinctly.

4th. None appearing with more frequency.

Reasons for these changes are: 1. The high mean line heat readings were often based on influence of external variable increasing intensity. With external influencing factor subtracted because of shielding, mean line heat readings have established internal abnormal high "norm" of case. 2. Low mean line heat readings remain the same because they were internal abnormal low "norm" and were not influenced. Neither were they decreased by external variable by drugs, because our laboratories checked this possibility each week. 3. Break heat readings stand out

more marked and distinct because of reduction of high mean line heat readings from which it broke, and also because of low mean line heat reading not being raised by external variables so that instead of having an average of a 2 or 3 point break from low or high mean line heat readings, we now often get an average of 3 or 4 or more.

TEST NINE

In conducting tests of our external variable and constant problem, we watched for "radio static days" when static was bad day and night in radio sets. Regardless of what distant station tuned for, static filled the loud-speaker. These were days we particularly watched nature of NCM readings as taken outside our shielded and grounded booth, where no shielding of any kind existed on instrument, patient, technician, or room. They developed unusual peculiar twists, mean lines jerky, running high, switching from L to R or vice versa, jumping from one side of median line to other. These are by-product effects of external variables breaking thru skin insulation of atmospheric static electricity and backing into human receiving set, throwing NCM sensitive meter readings off usual constants established on regular days when static was absent. If this should happen in one case on a static day, it could be an incident; in several, it might be a circumstance; but when this happens in many cases (not all) in a day's run of a Clinic, and is prominently observable on various occasions under like conditions, it is an example that the usual is happening to rhythmic nerve force flow

of man. Low mean lines of heat do not seem affected vitally. On static days, outside of booth, low average of number of break readings slightly increases, necessitating corresponding increase of adjustments.

Non-magnetic shielding can be used to shield out Hert-zian waves from a wave-length of .0205 centimeters to 5,498,000 centimeters or of a frequency of 1,460,000,000,000 cycles per second to 5460 cycles per second. This includes everything in the spectrum from the lower frequency end of infra-red waves through longest waves used in radio transmission. As we go up in the frequency range, we have infra-red-solar radiation—ultra-violet which can be stopped by various opaque materials. From there up we get into X-rays which can be stopped by lead and then into the phenomenon of Cosmic rays which will penetrate up to 16 feet of lead.

National Geographic Magazine, May, 1936, page 697, had an article relative to cosmic rays being swung around in their paths by the earth's magnetic influence. If this can occur to these rays having the energy of 100,000,000 electron volts at an altitude of 40,000 feet, the interference to the much lower powered X-rays in the more intense field close to the earth should be quite considerable.

TEST TEN

Observations made of earth's magnetic influence using a 10"x12" loop consisting of 26 turns of Litzendraht and a very sensitive micro ammeter. Loop was swung so as to cut the earth's magnetic lines of force.

TEST ELEVEN

4/17/36 8:00 A. M. In booth Axis of Loop N&W 14 Micro amp.
 Axis of Loop N&S 12.25
 Outside Axis of Loop E&W 15.75
 Axis of Loop N&S 14

Copper screened booth does not shield magnetic forces. Does shield out radio waves, electric waves, all Hertzian waves down to heat waves.

TEST TWELVE

4/18/36 6:00 P. M. Outdoors 22.75

TEST THIRTEEN

4/19/36 1:30 A. M. Outdoors Very erratic highest deflection 61.25
 —evidences of Aurora Borealis.

TEST FOURTEEN

4/19/36 10:00 A. M. Shield of $\frac{1}{2}$ " mesh steel wire insulated from ground—north side only, close to shield 19.25,
 3 feet from shield 17.5 same results with shield grounded.
 20 gauge steel on north side only 22.75.

TEST FIFTEEN

4/19/36 6:00 P. M. Loop and meter in auto, all steel body and top
 Car headed south 5.25
 Car headed north 8.75

TEST SIXTEEN

4/20/36	8:00 P. M.	20 gauge steel north and two sides.	
		Top and bottom	22.75
		All around	19.25

TEST SEVENTEEN

4/23/36	10:30 P. M.	Cast iron plates in conjunction with 20 gauge steel.	
		3 sides top and bottom	8.75
		Cast iron only—North side and bottom	10.5

TEST EIGHTEEN

4/25/36	2:00 P. M.	Mass of cast iron south and east of loop	15.75
		Considerable mass of steel north side only	15.75

It appears that the greatest absorption occurs in the presence of cast iron.

In the study of physics, usually the experiment of showing a magnetic field is performed by placing a blue print paper over a magnet and sifting iron filings over it. When the paper is tapped gently, the filings arrange themselves in the direction of the lines of force. After exposure of the light a few minutes, the print is developed giving a permanent chart. This shows that the magnetic force exerts its influence upon iron filings through paper. Copper, tin, lead, zinc, wood, glass, aluminum, and many other substances do not interfere with the passage of the

magnetic force. The iron filings seem to be affected as if these substances were not present. These substances are transparent to magnetism just as glass is to light. If you use a sheet of iron the same is not true as the lines of force do not cross the iron but enter it and follow a path within the iron itself.

TEST NINETEEN

A compass in iron-shielded booth was placed on North wall, facing towards South; placed on East wall, facing West; on West wall, facing East, and on South wall, facing North. No matter where placed, it always went "N." This perhaps is confusing until it is learned that on North wall it should have been "N", but on East wall it should be "E", West wall "W", and South wall "S". The magnetic waves are so trapped and reflected around the outer walls of booth that no matter where placed it was affected by north current regardless of location or direction. Outside booth it took its usual course and pointed to its proper direction.

TEST TWENTY

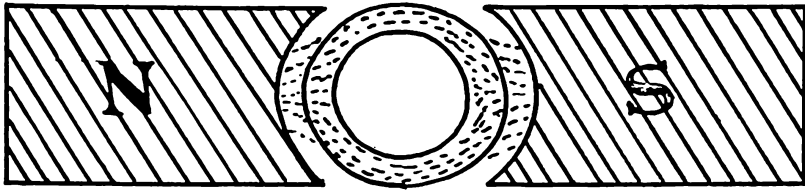
SUPPLEMENTING TESTS DURING APRIL

May 25, 1936, 7:45 A. M.

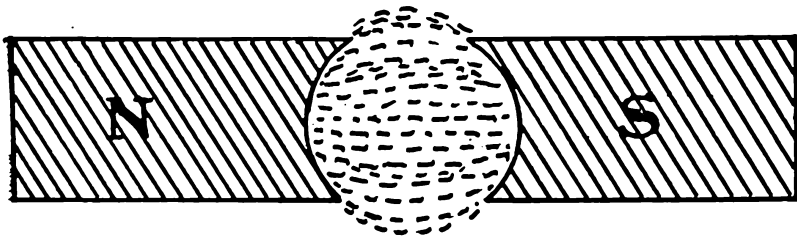
In iron and copper shielded NCM booth	5.25 Micro amps.
Outside of booth	15.75 Micro amps.

This indicates that the iron offers an excellent path for the transmission of the lines of force.

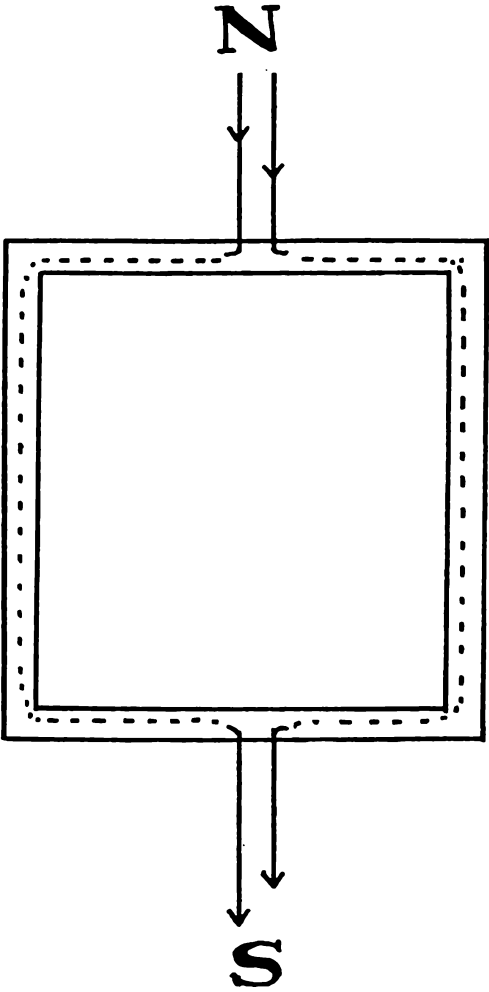
William Gilbert, about 1600 A. D., published "De Magnete," a work that contained many interesting facts



Lines of force passing across the air-gap between the poles of a magnet.



Affect of iron ring between the poles.



which he had learned by his experiments. Gilbert fashioned a little sphere out of lodestone. This he called "terrella," or "little earth." When he placed small pivoted magnetic needles at different positions on this sphere, he found that their behavior was the same as magnetized needles at corresponding places on the earth's surface. The earth in its effects upon magnetic materials acts as if it were a huge magnet. Its lines of force appear to be concentrated at the magnetic poles. Pieces of iron which have been lying in contact with the earth for some time usually show some signs of polarity, particularly if they lie parallel to the earth's magnetic meridian. Across and through water and all known substances, the magnetic forces will act, with a single exception however, that magnetic forces will not act across a screen of iron or other magnetic material if sufficiently thick.

If a small magnet is placed inside a hollow ball of iron, no outside magnet will affect it. The reason is that the magnetic lines of force are conducted off laterally through the iron instead of penetrating it. A cage of iron will therefore act as a magnetic shield against outside influences.

On the basis of the foregoing, if we were to construct booth walls of cast iron of sufficient thickness, we could shield out the earth's magnetic influences, the lines of force taking the path indicated below:

IRON GROUNDING AGAINST MAGNETIC WAVES

Photos No. 4 and No. 5 show first process of shielding and grounding radio, electric, and Hertzian waves. Photo No. 6 shows second step of surrounding booth with iron

sheeting to ground magnetic waves. North side of booth is entirely and completely covered with iron sheeting. Steel or copper will not do for magnetic waves. Door of our NCM booth is on North side. Sheet iron also completely covers East and West of door. Iron sheeting completely covers door. Between door, top and both sides, East and West, are sliding hinges covering interspaces between door and balance of North side, overlapping all spaces, over which slide gliding plates on springs which make and keep constant contact whether door is closed. Above entire North side, from East to West, on ceiling is an overhanging (on North) iron sheet which extends southward to one-half length of booth. Booth being 8 feet long, roofing iron sheet is approximately $4\frac{1}{2}$ feet south, extending entirely from East to West ends of booth. Instead of butting material, all overlaps and make perfect continuous contact. All magnetic waves, which flow North to South, are deflected upward and backward and thus deflect over the other or open half of ceiling which is open except for copper shielding. On East and West Sides, iron sheeting extends superior to 5 feet from floor. This also extends around to and on South Side of booth. Thus magnetic waves which flow from North are deflected either upward and over roofing sheeting or on either East or West sides, and thus pass around sides to South side where they flow off, continuing South. Each corner is completely joined by actual overlapping contact of North sheet with roof, East and West sheets. Booth has been tested and found to be completely shielded and grounded free of any and all external variables which could vary, change, modify, add to or subtract from mental-impulse, nerve-force, energy flow in human body of patient which readings are under observation.

Up to this point, **every** external variable, such as radio, electric, Hertzian, and magnetic waves, has been removed from study being conducted. There are 672 square feet of sheet iron protecting this NCM booth and North side of electro-cardiograph and tycos recording sphygmomanometer laboratories. Sheetting used weighs 3 lbs. per square foot. This brings 2016 lbs. of iron into "just a detail" but important to protect accurate work to secure correct NCM readings, to know when to and when not to give an adjustment, to the ultimate end of saving human lives efficiently.

HOW DO YOU SLEEP AND WHY?

If there is a stiff wind blowing, it is easier to drive a car on highway with "tail wind" which flows the way you are driving. If there is a "head-on-wind," going is stiff because you "buck the wind," which burns more gasoline, slows up speed. If there is a "side wind" you keep pulling against that side. As you pass a hill, farm building, or big truck, you side-slip slightly which you must quickly check after you pass it. A wind has a human obvious and objective effect to a driver of a car. How do you sleep? Is your head North, South, East, or West? It has been a suspicion to thinkers that it is better to sleep with head to North. It has been a "suspicion" because it was not within realm of scientific proof, forces being so subtle they were beyond computation. It is now proven that it is proper to sleep with head to North. Forces within human body flow from head (North) to feet (South). It is easier for human forces to travel with North to South Pole forces than it is to buck them all night. To try to sleep with head to East or West is to side-swipe forces all night, exactly as the car side-swipes a side wind on highway. If human forces

flow from head (West) to feet (East) and earth's forces flow from North (left) to South (right), it is obvious one crosses thru and opposes other, forcing one to flow thru other, opposing each the other, with human body burning more energy attempting to hold its own. Other things being equal, people rest better, more quietly, wake up more refreshed, if they sleep with heads to North.

There still are, however, variables left in picture which we discuss later. What we refer to is variables of what eye sees or thinks it sees; what mind remembers or thinks it remembers; what hand draws or tries to draw, which variables exist between what the galvanometer needle does and what the NCM technician tries to record accurately on paper. The time lag and human differences are not constant.

+ OR — "NORM"

In a previous place we discussed fluctuations of "norm," above "norm," and below "norm." We are interested in "norm," for we deal with health. We are interested in artificial below "norm," as that is induced externally with sedatives, narcotics, hypnotics, etc. (See Addendum No. 19). Electricity in bolts of lightning could be a sedative, even unto death (or as in electrocution), but external variable quantities found in atmosphere, homes, offices, etc., are the smaller amounts that act as a stimulant, therefore increase "norm" to somewhere above "norm." We are interested here in studying above "norm" which is a stimulated rhythmic nerve force flow and thus increases mean line heat readings beyond what they should be, either by deflecting mean line from median line, or by suddenly crossing mean line across median line from

R to L, or L to R, etc. Too frequently there are short-range wide-sweeping mean line heat readings which bewilder ordinary NCM reader in not knowing whether it is or is not a break reading. Rather than pass it by, too often adjusts when he should not, which changes readings again, and bewilders him more than ever. If reading is made accurately, without external variables, it would be a distinct break from clean-cut mean line heat reading and thus dissipate any doubt he might otherwise hold. Too often doubts between mean line heat readings and breaks are not distinct, where one seems to be similar to what one thinks the other should be. Under shielded and grounded conditions these distinctions are clear and concise.

External forces which bombard, invade, affect internal constant are comparative in quantity. They can be minute and pass unnoticed by human affected. They can be gigantic and noticed perceptibly. Smaller and more subtle quantities of external atmospheric energetic variables are constantly bombarding, entering and effecting human body as much or more than are greater known quantities. It is another phase of concussion of forces even if lesser known. In our present study the human would not know exists, nor could he alone know they invade and effect him, but which extremely sensitive galvanometers prove. Larger quantities of concussion of forces are sensed by human beings because of violence at time of accident having sufficient intensity to be felt. Smaller quantity concussion of forces could not be sensed by human means because it is so minute that only means far more sensitive than those at human command could detect them. No human can sense radio waves with their voices or music in air, neither can human senses measure existence of electrical or Hertzian energy waves; neither can the

human sense a magnetic North to South pole wave. Yet radio receiving set absorbs and amplifies until radio waves are heard by human ears; sensitive galvanometers prove electrical and Hertzian waves the same as a mariner's compass is affected by polar waves so human eye sees its action. The larger quantities conflict and produce misalignments, vertebral subluxations, dislocations, and fractures, involving large quantities of human matter destroying continuity of tissue structure. The lesser quantities conflict involving lesser quantities of human matter; bombard, invade, and act only as external variables on internal energy flow direct; modify, amend, add to, or subtract from internal constant mental-impulse nerve-force flow, without violence to tissue structure but with disturbing value to continuity force flow. It is this external variable we now trap out in our shielded and grounded laboratories. It is the human internal effect unaffected by trapped out external we now record and interpret.

NCM SHIELDED READING BOOTH

To this end, The B. J. Palmer Chiropractic Clinic has builded and is now using a completely shielded and correctly grounded Neurocalometer reading booth. Patient and technician enter room, door is closed, booth is now completely shielded and grounded. Reading is made. That reading is as accurate as is possible to be made of a case when only case itself is involved. One other possible suggested improvement could be made, viz., Neurocalometer technician read from outside the room, or so ground the technician, if inside, that no antenna value of his body can affect nerve force flow of patient and thus distort accuracy of reading. To this end, our NCM reading cage

has a rubber floor, and technician reads with one rubber glove. Tips of NCM are hard rubber, but other bare hand of technician rests upon patient's head, thus antenna contact would be made. A certain amount of nerve force flow continuity of his body can effect nerve force flow continuity in case. Even though these external variables are omitted, it is that much more added to dozens of other external electrical bombardment variables which have been eliminated, and tends to approach a greater degree of accuracy and competency in Neurocalometer reading than established before. When cases are being NCM read in NCM booth, absolute silence and no motion is permitted of those in booth. Visitors are rarely permitted in reading room at time readings are made. Room itself is quiet. No external variables are injected or can inject themselves into readings. Unduly cautious, perhaps, but efficient work always is meticulously done.

At the time of this publication it is too early to lay down final rules or mark definite or positive statements regarding efficacy of NCM shielded reading cage and its effect upon changes occurring in NCM readings, but we can give positive assurances of preliminary conclusions. Rather than wait until some subsequent time to release this data, we give it now with the promise that we will have data and proofs for those who attend our Pre-Lyceum Classes. Meanwhile, we bespeak your cooperation in helping gather data which we would be pleased to present at that time. (See Illustrations 4, 5, and 6.)

SAME "FRONT" MORE PROOF

Medical principle and practice asserts that **cause** and **cure** of disease is external. Chiropractic principle and

practice assert that cause and cure of disease is internal. This article seems to lay ground work for admission that external energy variables influence and change internal functional constants and/or internal constant-variables. Are we here and now setting up an outside cause of disease, an environmental cause, an external condition which is permanently present? Are we changing from our position of 41 years to (more or less) agree with medical principle and practice as to cause and cure of disease from outside? Every scientific problem has a solution when its constants are researched for and found. Present problem is not solved until its constants are ascertained and these modern facts are consistent and square with all past facts.

NEW FACTS

The new facts here raised are :

1. internal constants
2. internal variables
3. internal constant-variables
4. external constants
5. external variables
6. external constant variables and
7. how first three work upon latter three
8. how first three are worked upon by latter three ;
9. how latter three influence activities of former three.

All is consistent with research of former years. For example: poison cycle wherein substances incompatible

with body welfare reactions become one of duality of clashing forces, concussion of forces, vertebral subluxation being the result, inducing dis-ease. Because of the preceding, an internal cause of a chemical not-at-ease exists in human body, creating internal condition A, comes in contact with external chemical condition B, two combined internally create internal condition C, called an epidemic. It takes two forces—one internal, other external—to produce a vertebral subluxation and, by same token, to correct it. When greater is external it will overcome resistance of normal internal lesser force. In present language, external variable of a bolt of lightning could kill internal life constant of man which could be followed down thru its gradients. We do not now break that wall by saying that germs, chemicals, external temperatures, gases, etc., cause internal diseases. Neither do we now break that treatment wall which permits any to say for us that we admit external cures possible! That there is a consistent assembling of one series of facts today with another series of facts yesterday, is true of any movement scientifically sound. (See Addendum No. 8.)

INTELLIGENT AND IGNORANT ENERGY

1. Is energy and matter all that is necessary to produce life and growing things?
2. Is intellectual energy necessary in matter?
3. Does dis-ease merely represent an absence of energy in matter?
4. Does dis-ease prove absence of a normal quantity of intellectual energy in matter?

5. Can cure come from injection of energy into matter?

6. Or does cure come from internal natural action of intellectual energy in matter?

A heart removed from a living animal, removed to a glass jar, has been kept in a state of motion for years. Is that heart living or is it so much muscle kept in a state of motion? Saline solution and temperature energies will keep it in motion. Energy cannot make it live. Muscle removed from living frog's leg, placed on glass and electrical circuit passed thru it, with positive at one and negative at other, will jerk every time electrical energy is applied. Who would contend that the muscle is alive, no matter how long or how many times it jerks?

How does intellectual energy enter the body? Is it from periphery to epiphery, thru afferent nervous system, thru water we drink, air we breathe, or food we eat? Is it from periphery to epiphery, thru afferent nervous system, thru senses such as sight, hearing, taste, feeling, or smelling? There being no other physical media of contact between man and environment, we ask: Is it so subtle that it does not need external physical media? Does it enter in some way yet unknown to us, going to brain direct? It is plain that brain is the source of all internal intellectual function by means of which we have our existence. (See Addendum No. 9.)

Does intellectual energy which flows efferently from brain regulate and control all internal functions of man independent of influencing facts which happen at periphery of nerves, if it can get thru to perform those natural func-

tions of man? Is brain of living human body **dependent** upon external physical media for intellectual energy? If intellectual energy flows normally from brain to body, is more energy than this needed from environment to make man healthy? Answers are obvious! Intellectual energy flowing from brain to body is all-inclusive, all-conclusive, all-sufficient, and all-independent to meet law of demand and supply in health and disease, to control and govern perfectly **all** functions in all parts at all times if it can get thru without interference.

We admit a distinction between **internal intellectual energy** necessary to regulate and control function of a living healthy body, and **external ignorant energies** (and this is a poor term) that **try** to get in and run it as a substitute for Innate Intelligence. We do not make any difference between whether "external ignorant energies" which "try to get in" come from environment or are attempted to be induced by educated man. That external ignorant energies exist in multiple forms outside the body, have their attempted beginning at peripheral nerves, and try to begin their flow from periphery to epiphery thru afferent nerves is true. That they are dangerous foes to body welfare when entering wrong way, at back door, is evident or we wouldn't now be setting up a method of trapping, shielding and grounding them out to gain internal constants. (See Addendum No. 10.)

A DIFFERENCE

Intelligence and Ignorance have other names such as Understanding and Misunderstanding. They are foes. They have always been in conflict. One helped, other hurt. One advances, other retards. Intelligence is constructive,

ignorance is destructive. Intelligence can construct for centuries, war can destroy all in one year. Temples which took ages to build can be destroyed by 100 pounds of gunpowder. Lives which took generations to produce can be killed by a few drinks of hard liquor. One human life which took 50 years to build can be destroyed by one bullet in one minute. Confidence which took years of straight living to produce can be upset by one lie. Man can build himself into a masterpiece, and one bolt of lightning can kill him in a second. These are samples of ignorant external variables in conflict with internal intellectual constant. A confused greater quantity of ignorant external variable can upset in minutes years of quiet methodical building of internal intellectual functions in man. What is that difference between energy which builds and energy which kills man? This: intelligence flows from within and ignorance flows from without; energy which comes to man naturally from above downward and inside outward, and energy which forces itself into man unnaturally from below upward, from outside inward. There is no difference between energy and energy. There is a difference between intellectual energy which builds and ignorant energy which destroys. (See Addendum 4, first quotation.)

The same facts of

- (1) Invasion and resistance
 - (2) Internal Intellectual Energy and External Ignorant Energy
 - (3) Internal constants and variables, and External constants and variables
- inject themselves into the Chiropractic principle and prac-

tice problem before us. Internal intellectual energy created, flowing, directing, and arriving in function to reproduce babies, develop man, mature him, keep him healthy and living, restoring sickness when below par, comes from above downward, from within outward. How it may get into brain may still be a problem, answer to which none of us may know; but get there it does, and from there it flows to all parts of body, and from there it must come if body is to continue to reproduce, produce, live, be healthy, and get well when sick. If man gets sick, it is because that flow from there is interfered with. If man is sick and he needs get well, that flow must come from there if he gets well. If "life" was not intellectual, if "life" was but energy, and if sickness was absence of energy, why couldn't we hook up a dying tuberculotic to a wet battery and inject "energy"? Intellectual Life cannot be imported from foreign sources; it cannot come from exterior injection, from bottle via teaspoon, or from some animal, mineral, or vegetable kingdom. It cannot be extracted from grease or liquid, neither can it be taken by mouth, skin, or rectum. It comes as an abstract and must be impregnated with natural intellectuality to be of life building, life giving, life sustaining, constructive health building value.

"Life" must be intellectual and must come from above downward, from within outward. That is why energy via lights, heat, cold, rays of various kinds, radium, etc., cannot have natural living value. It takes intellectual energy to build the temple of man; that is why war, gunpowder, bullets, lies, liquors, etc., cannot be stirred into dirt in the ratio of $\frac{7}{8}$ water to $\frac{1}{8}$ matter and produce man. Energy is energy, but there is that difference between intelligent energy which builds and ignorant energy which destroys.

For these reasons, external variable ignorant energies frequently and seriously interfere with internal constant intellectual energies and their smooth workings, remembering that often intelligent energy may be comparatively weaker in given quantities than is the external variable. One bartender shoving hard liquor may cause more murders than one million people praying in the Amen church corner could prevent. A small quantity of ignorant active energy can often accomplish more than a large quantity of passive intelligent energy.

CONSTANTS AND VARIABLES OF THOUGHTS

Man thinks

—thinks thots

—thinks Educated thots

—thinks quantity and quality Educated thots

—thinks Educated thots of character; good or bad

—thinks quantity and quality constructive or destructive Educated thots

—thinks and puts thots into action by directing thot power to places to perform action

—cannot think Educated constructive thots and perform Educated destructive action

—cannot think Educated destructive thots and perform Educated constructive action

—can think Educated constructive or destructive thots; suppress, revoke, or modify them before they act.

Educated thot can be essenced or diluted, in quantity and/or quality, within potential human range.

The above is a practical living constant as we internally analyze ourselves. The by-product of any or all changes we may make in process, can be registered on a sensitive instrument sufficient to prove themselves.

Man thinks and acts within a range of use of internal power to think and act with. "Norm" means to keep within the range, time being an essence of that range. "Norm," range and time, is safe so long as it keeps within; unsafe above or below it. Unsafe above because of intensification of quantity, unsafe because of shortening time. Unsafe because of dilution, unsafe because of lengthening time.

"Worry," "fear," "hate," "greed," any emotion, passion, or prejudice can be internally essenced or diluted; time can be shortened or lengthened in the process of production of quantity or quality of thot, which can be expressed in like character with the Educated body, all of which can be suppressed or liberated, until they reach quantities above or below "norm" and thereby become an internal variable which can and does temporarily unbalance "norm" in a reading of various kinds with various instruments which detect variations of flow of nerve energy within its rhythmic range. (See Addendum No. 20)

"Worry" can make normal man temporarily a variable; "fear" can temporarily unbalance man's sanity; "hate" can temporarily drive man to do things which in a serene

moment he would not do; "greed" will temporarily cheat, lie, and steal beyond normal intent of that individual. Such variable, other things being normal, would be temporary and would not have permanent value in building a chronic dis-ease of the temporary unbalance. Mentally, educated man can get temporarily off "norm" by essencing or diluting normal range of quantity and quality thots. His physical follows suit and is temporarily following essenced or diluted ideas.

A criminal acts misdirected normal energy. A "norm" is temporarily or permanently unbalanced; "temporary" if working within "norm," "permanent" if working outside "norm" as in an anomaly, pathology, and/or trauma. "Temporary" if based on mental action of emotion, passion, or prejudice; "permanent" if based on mental sick or insane action following subluxation suppressing "norm" flow. It is this shading line between temporary effect (which is not unlike a permanent effect) which psychologists do not distinguish between. Man can temporarily work himself into an emotional, passional, or prejudicial pitch that he can produce or reduce a subluxation which would create or restore a permanent effect of like or dissimilar character, or permit its cure if it existed. The permanently insane are insane on the subject they were thinking when they were temporarily unbalanced.

"Norm" flow can be temporarily activated by hate, fear, worry, greed, or other emotion, passion, prejudice thots, and commit suicide to self or murder to another. Suicide is murder to self. Such is "temporarily unbalanced" by temporarily forcing regular constant rhythmic flow into an unsettled irregular non-rhythmic

variable. Each moment has its regular "norm" constant quantity of flow. To demand more than that moment's generation by an intensified demand thru hate, fear, worry, greed, or other emotion, passion, or prejudice, is to pull on the supply of moments ahead. When they are demanded and supplied, those other moment's supply will note absence of their supply when those moments arrive and it is not there. Religion does none harm when thot sanely with normal demand the supply of right quantity within moment supplied. It is possible "to get religion" intensified to commit murder "for Christ's sake"; or religion can be diluted so that responsibility to self is lost and community value is lost to society. These are "temporary absence" of sane thinking supplies. (See Addendum No. 20)

Alexis Carrel in his "Man, The Unknown," discusses the criminal who performs actions is often caught, punished for acts committed. He deplores absence of any method of detecting man who mentally becomes temporarily unbalanced and commits "crimes." (See Addendum No. 11)

CONSTANTS ARE SCIENTIFIC

Sciences are founded on constants. Without constants, they could not and would not be scientific. It is establishment of constants which makes it possible for scientists, regardless of country, to understand and talk same language to and amongst each other. Mathematics, chemistry, and astronomy are sciences which are based on constants. Any problem is such only because of interpretation to be given variables in relation to constants, properly listing and in-

terpreting them as they fit into relation with constants of that problem. It is variables that make a problem. The great aim and ultimate objective of science is to eliminate variables, establishing constants. Medicine is what it is because it is made up of variables. Yet pursuit of medicine down thru centuries has been to eliminate them. No physician knows reaction of any particular drug on any certain person. Drug may be a constant but person to whom it is given is a variable; reaction of one upon other being uncertain. If variables which go to make up present day theories of therapeutics, and variables of empiricism of practice of medicine could be eliminated, materia medica might be a science, except for the fact that if all its variables were removed, it would not exist at all. (Dr. George Crile, in his "The Phenomena of Life," used "constants" in all his research work. See Addendum No. 17.)

It has been our desire, covering a field of 41 years of research, to eliminate variables in connection with principle and practice of Chiropractic as applied to human body in sickness and restoration of health. That man is sick, that sickness has a cause, that this cause is inside body, that if this cause was corrected cure should also be found inside, seemed constants. To prove these meant to eliminate variables which contrasted and conflicted with them. Forty-one years of research finally brought us to HIO constant subluxation, located by spinography as a constant, adjusted as a constant. The field of NCM research has been to establish a constant in NCM readings, both before and after adjustment, by eliminating variables that denied the constant. Shielded reading room is a further step in direction of elimination of external variables helping establish internal constant with greater efficiency than before.

Science is based on constants. Chiropractic has been called "a science." It is a science if it is based on constants.

The B. J. Palmer Chiropractic Clinic has been dedicated to finding scientific constants in cases. To establish **before adjustment constants**, we have not less than 30 different records made and interpreted. This number grows as we eliminate variables. Many of these are checked against case weekly. All of them repeat when case leaves our Clinic, that we may establish **after adjustment constants**. Records of case constants speak for themselves. When results are attained, we know how, why, when, and where, and can duplicate proofs if necessary at some future time.

CONSTANTS OR VARIABLES IN SPINOGRAPHS

The B. J. Palmer Chiropractic Clinic works with and from constants in each phase of establishing records to establish before and after conclusions of facts. When we speak, we know! I cite two examples of how we eliminated variables and established constants:

(a) On 1/15/36 we took a lateral spinograph of Case No. 78 to exhibit extent and degree of infiltration and induration of exostotic muscular growth in cervical region. Several days later, Daily Case Report suggested osseous growths were rapidly decreasing in size. To prove or disprove this, on 1/24/36 we took another lateral spinograph to exhibit extent and degree of dissolution of exostotic muscular growth in cervical region. For every spinograph

taken, there is a work-sheet record. Here is the record for these two spinographs:

	1/15/36	1/24/36
	Lateral Natural	Lateral Natural
Tube distance	36"	36"
KVP	50	55
Tube	7-100	7-100
MA	50	50
Time	$\frac{1}{2}$ "	$\frac{1}{2}$ "
Patient's weight	28 lbs.	28 lbs.
Bucky	No	No

All elements were constant except KVP's, one exposure being 50, other 55. Here was a variable. This makes a difference in density of shadows and produces two pictures which are not constants nor are they constant comparatives. Average X-ray technician or spinographer might accept them of equal value. Not so in The B. J. Palmer Chiropractic Clinic. Our Staff Technicians were brought into conference and following rule established: when subsequent comparative spinographs or radiographs are made, regardless of whether they be hard or soft tissue, technician must first secure Case Folder, check back on record work-sheet on that exposure, and duplicate it in every particular.

(b) On 1/20/36, Case No. 65 was examined by two of our Staff Examining Physicians. They were interested in soft tissue of heart. Picture was taken. After studying heart picture, they decided three days later they wanted a lung picture. They set up the two pictures and tried to make a comparison of heart in both to see if heart condition in first picture was same as heart condition in second. Here is record of those two exposures:

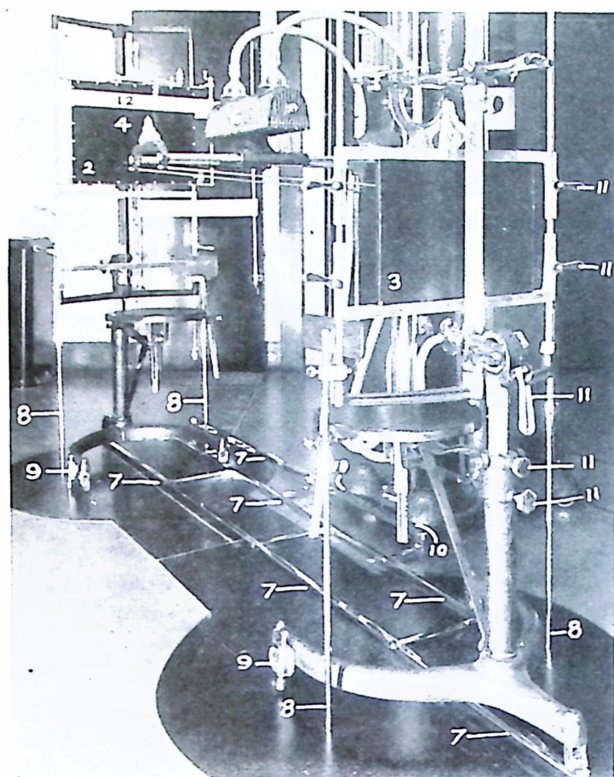


FIG. No. 7

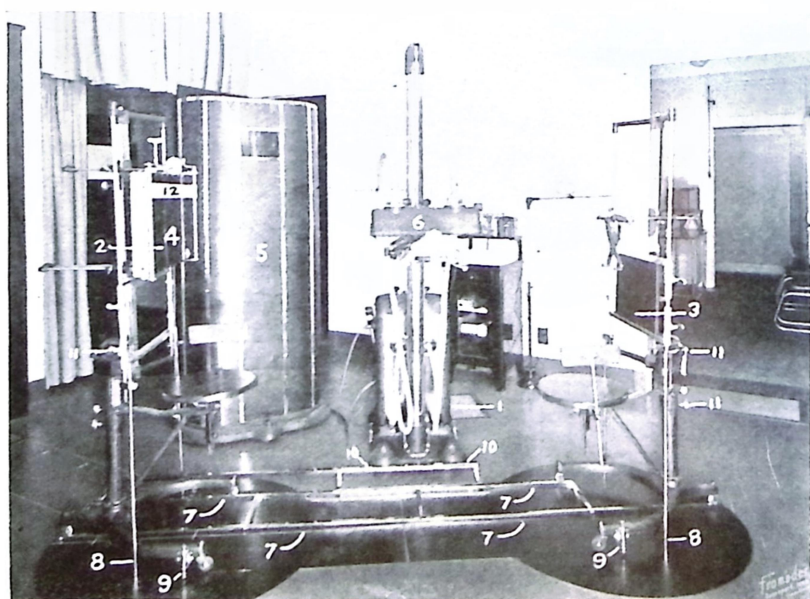


FIG. No. 8

	1/20/36	1/23/36
Tube distance	72"	72"
KVP	73	73
Tube	7-100	7-100
MA	50	50
Time	1 $\frac{3}{4}$ "	2 $\frac{1}{4}$ "
Patient's weight	125 lbs.	125 lbs.
Bucky	No	No

All elements were a constant except time of exposure, in one being 1 $\frac{3}{4}$ seconds, other 2 $\frac{1}{4}$ seconds, first being proper for heart, second being proper for lungs; but neither being proper for comparison of either heart in both or lungs in both. Upon taking second picture, Staff Members "compared" pictures. They were not comparative because penetration constant for soft tissue of heart and of lungs was not the same. One showed greater density than other. We established this rule: If a heart is desired in one picture,

Figs. No. 7 and No. 8.

First two photos of this X-ray equipment series exhibit base ground-work or skeletal structure. On this is later built all else as described, both with pictures and in book text.

1. X-ray unit.
2. Cassette holder for bone picture.
3. Cassette holder for soft tissue pictures.
4. Bucky diaphragm.
5. Protecting body lead shield.
6. Oil immersed fine focal point X-ray shock-proof tube.
7. Rigid track referred to in text.
8. Adjustable locking rods which prevent side sway movement of cassette holders.
9. Frame floor lock preventing movement of cassette holder on rigid track.
10. X-ray unit always at right-angles to rigid track of cassette holders.
11. Every movement of movable parts has a lock nut preventing any motion, once set, during exposure.
12. Head band preventing motion of head during exposure.

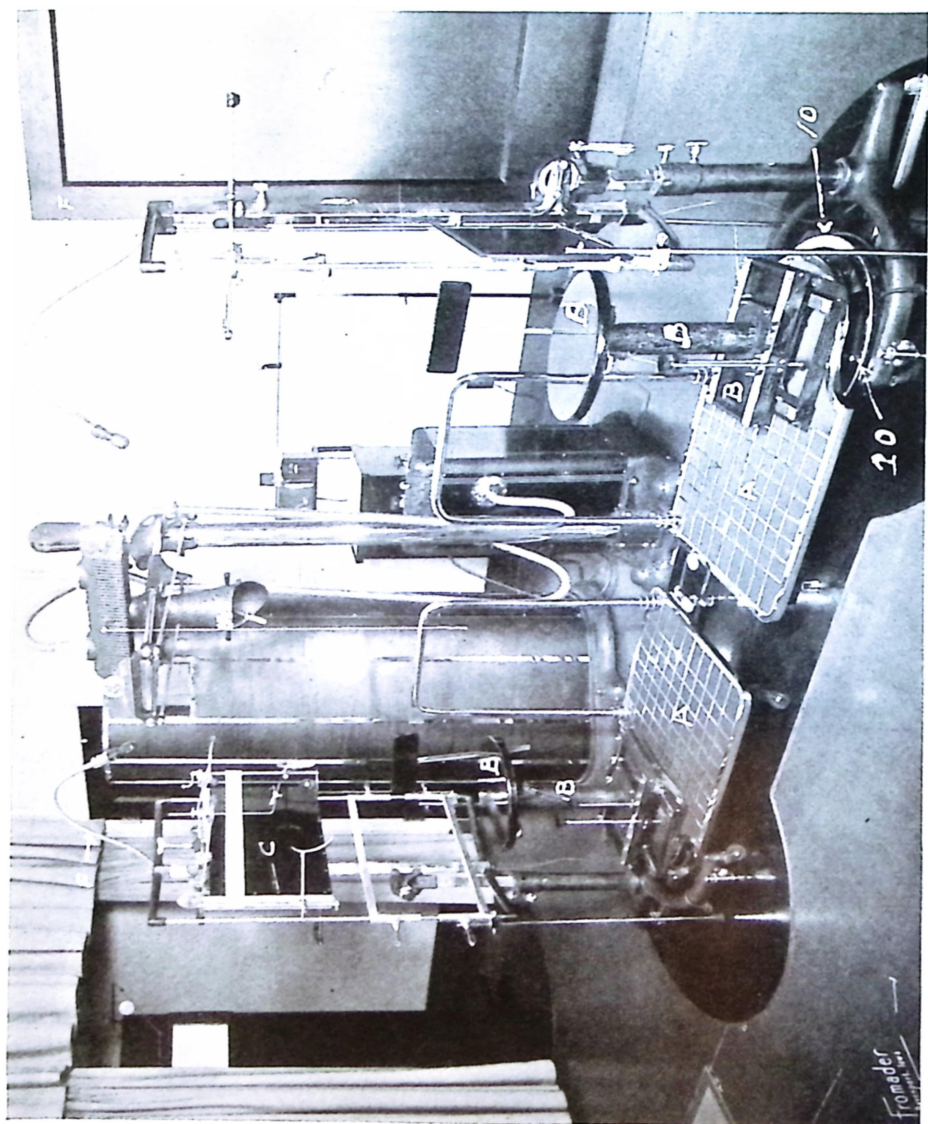


FIG. NO. 9

upon seeing that a lung is desired in another, two separate pictures must be made, one with density necessary for heart, other with density necessary for lungs due to different densities. If, later, a comparative picture is desired of heart or lungs, then record work-sheet must be secured from Case Folder, checked back, and one or ones desired duplicated in **every** particular.

Fig. No. 9.

Complete, precise, exacting, and accurate X-ray unit apparatus, for flats and stereos, as used in The B. J. Palmer Chiropractic Clinic.

This photo shows four complete units:

On the left, stereo unit.

On the right, flat spinograph unit.

In center, X-ray unit itself.

Rear left, leaded shield for operator.

This photograph is followed by successive photos which illustrate detail.

Platforms (a) including entire seatbases (b) revolve around circle 10—10, as better displayed in photograph 12. 10—10 is graded into inch degrees on circumference of revolving base.

(a) Footbase divided into squares. Around edges on two sides is reading "a", "b", "c", etc. On other two sides are numbers 1, 2, 3, etc. Patient is permitted to be seated naturally, relaxed. Wherever feet assume position in first or primary set of spinographs, that becomes a posture constant for all future comparative sets. Note illustration No. 16.

(b) Seat and seatbase.

(c) 8 x 10 Bucky Diaphragm Cassette Holder.

(d) Cone.

(e) Electric flashlight equipment for centering light on patient, proving and ascertaining exact center of rays for exposure.

(f) Small electric globe extended over patient to light minute details for purpose of establishing figures in "posture constant."

Every mechanical portion which moves upon another mechanical portion, which has to do with ascertaining and establishing a position of some part of body of patient being spinographed, is ruled into inches and subdivisions so that position can be seen, written on record, and reestablished at future time to exactly and precisely reproduce same posture constant for purpose of accurate graphs.

CONSTANTS OR VARIABLES IN SPINOGRAPHY

Different Chiropractic offices follow different approaches to information re cases. Our profession is aware that ones suggested below are not all the possible combinations and complications of variables re office procedure of Chiropractors. Outline suggests variables more closely allied as directly applicable to the Chiropractic principle and practice.

Chiropractic patient, going from one Chiropractic office to another or talking with patients going to other Chiropractic offices, detects variables in office procedure. He may not understand variability in taking two or seven spinographs, except to think one office may be more thorough than other; but he can detect marked variables when one office takes none and another office takes spinographs. Lurking in his mind is that difference of variables and the conviction that there should be a constant in seeking chiropractic information to render improved chiropractic health service.

(a) No spinographs taken.

No pre-check NCM readings made.

"Adjustment" of vertebral subluxation attempted.

No post-check NCM readings made.

No post-check spinographs taken.

(b) Two spinographs taken—A-P and Lateral.

No pre-check NCM readings made.

"Adjustment" attempted.

No post-check NCM readings made.

No post-check spinographs made.

- (c) Two spinographs taken—A-P and Lateral.

Pre-check NCM readings made.

Adjustments given.

No post-check spinographs made.

- (d) Complete set of spinographs taken, including A-P and Lateral, A-P stereos, diagonal stereos, 8x36 full-length.

Pre-check NCM readings made.

Adjustment given.

Post-check NCM readings made.

No post-check spinographs taken.

The "d" procedure is all-sufficient to reveal location and position of vertebral subluxation; prove adjustment in restoring health. It secures all "before" information necessary. "Post-check spinographs" are necessary as "after" proof.

- (e) The B. J. Palmer Chiropractic Clinic, in addition to "d," goes further in checking, recording, and researching its cases. Here is our procedure:

Complete set of spinographs, same as "d"

Both pre and post check NCM daily readings

Before and after adjustment

Each two weeks case is in clinic, post-check spinograph set of A-P and diagonal stereos made

Upon leaving clinic, complete post-check set of spinographs, the same as taken at first, is made.

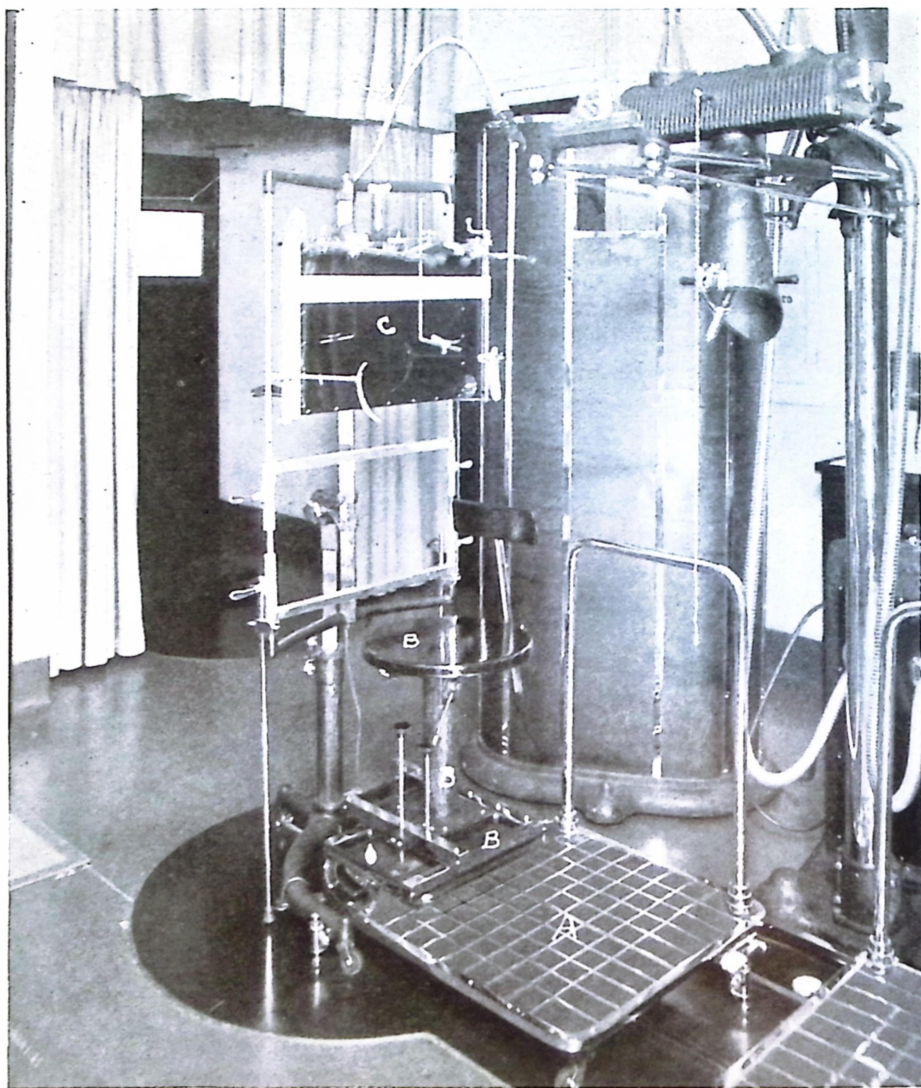


FIG. No. 10

Left unit of Photo No. 9. used for precise exposure of stereoscopic spino-graphs.

Regular check graph drawings are made after each new spinograph set is made.

By this procedure, we have an **every two week** check and on last day in Clinic a **final complete** check of **before and after** changes occurring in position of vertebral subluxation. Did it move from abnormal to normal position? Did it move at once or did it come to anatomical constant position gradually? Many questions can be and are answered by comparisons, one set with another. A study of cases, based on such methods, reveals sound data to reach conclusions of facts.

Where there is a variable office procedure, as listed under "a," "b," "c," etc., there must be variable opinions based on variables of office methods in researching facts. **His opinions are based on his character of practice.** If he does not take spinographs, creates one opinion. If he does, he has another. If he uses **NCM**, he has one process of reasoning which another has not, who does not use one. In The B. J. Palmer Chiropractic Clinic, we need secure the constant of scientific research of records made **before, during, and after adjustment.**

Dr. John Stoke puts it well when he says:

"A careful analysis is quite as important as a good adjustment. A poor adjustment may do good if the analysis is correct. A good adjustic move may do harm if the analysis is wrong. Be sure that both your analysis and adjustments are the best you can possibly give.

"The key is just as important as the lock. When Innate is locked from full expression in the body, ill health is the

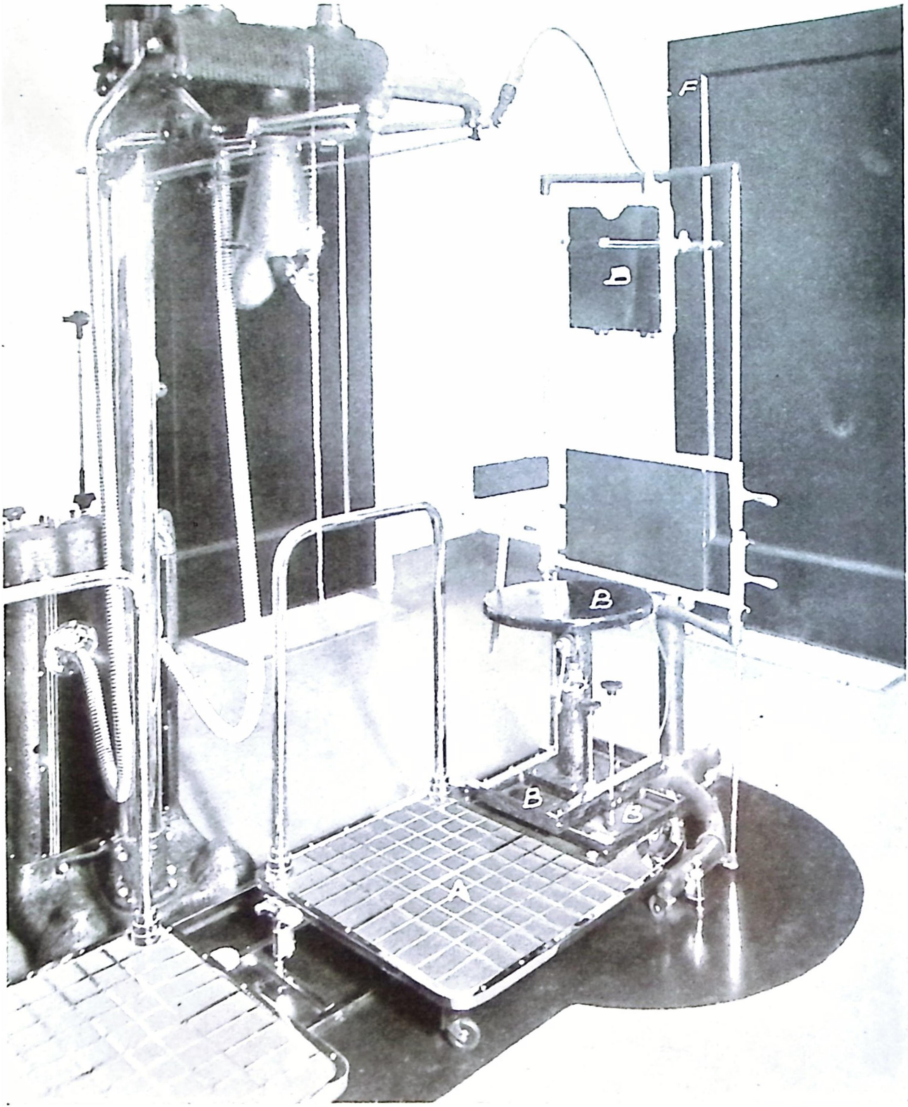


FIG. No. 11

Right unit of photograph No. 9, used for flat or single exposures of spino-graphs.

result. A subluxation is the lock. Atlas is usually the subluxation and therefore the lock. The adjustment is the key and it is important to know how to apply the key to the lock. Unless used skilfully, even a key will not always unlock."

CONSTANTS IN X-RAY LABORATORIES

Standard makes of well-known films have been exactly standardized as to base and emulsion. Developers and hypo fixing baths are exactly standardized. No matter where you buy same films, developers, or hypos, they are the same. To establish a standard that is consistently reliable, that always duplicates results under like conditions, is to create constants. Imagine confusion that would exist if two batches of base material of any certain X-ray film, or emulsion, were variables. Further imagine disgust and uncertainty possible in X-ray dark room if developers and hypos were always unknown quantities of variables, no two alike. Being constants simplifies high quality results always the same. How satisfying to know we can think, talk, write, and print certain constants as stated in Cases No. 78 and No. 65, and realize you know exactly what I mean and you contrast between constants therein referred to and variables pointed out. It is gratifying to know we set forth a manner of sequence and a method of constants in kind of film, developer, hypo, bath, technique, all of which have been brot to scientific constants of efficiency and same can work for you as they work for us and you can duplicate work done here in your laboratories.

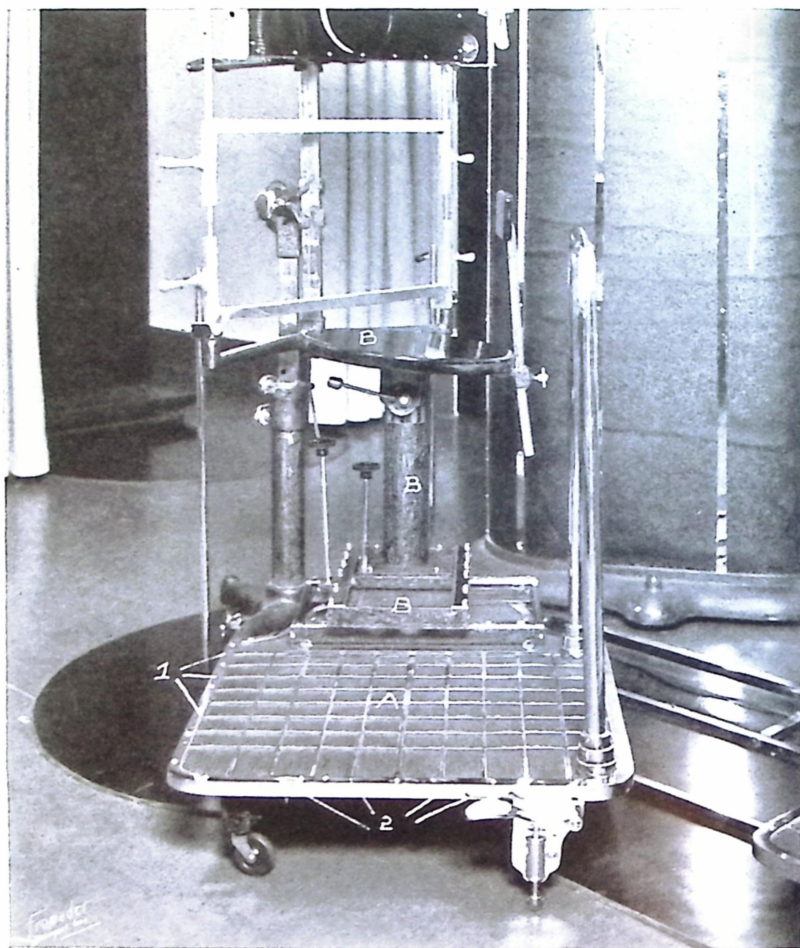


FIG. No. 12

Lower portion of left unit showing tilting of seat, moving entire seatbase to left on moveable platform; moving superior of seatbase to rear on inferior base. Entire moveable foot platform shifted to 45° angle for diagonal stereo.

Nos. 1 and 2 point to cross-bars on footbase, all of which are lettered "a", "b", "c", etc. on left and right bars, and numbered 1, 2, 3, etc. on front and rear bars, establishing foot posture constant.

PRECISION DETAIL

X-ray shadowgraphs can be manufactured to contain many variables which completely change desired result. Few know this better than we, exposing as we have plates and films since 1910, interpreting many thousands more referred to us for that purpose researching problems within them. Radiographs and spinographs are questions of densities and angles, shadows and depths, any of which can be modified and changed by one minor variable. Depths can make rotations where none exist, angles of exposure can create subluxations or curvatures, or eliminate them, when none might exist as portrayed. How easy to be careless and interpret a vital conclusion that may not exist in fact; tilt the cassette holder stool, raise one pelvis side, and behold a curvature exists; or perhaps intentionally tilt stool opposite way and take one out which was in, in a former picture. Variables that could innocently be introduced into before and after spinographs which would alter lordotic and kyphotic curvatures are: high heels before, stocking feet after, or vice versa; or, high heel on low pelvic side or vice versa, and scolioses would change. In research work being conducted in The B. J. Palmer Chiropractic Clinic laboratories, we have proved that if posture or exposure variables are carelessly done in X-ray work, it can actually exhibit a Left wedge as a Right, or vice versa. If such be, adjustment would be given wrong and case made worse. If constants are known and exclusively used, right posture and exposure will be made and only correct interpretation is possible after which accurate adjustment is given and case will get well. It might astonish us to know how many errors are wrongly interpreted or incorrectly adjusted and

responsibility for failure shifted wrongly to a just issue. Careless technicians, careless X-ray work contain more potentialities for gross error or malicious misconstruction than surgery—and that is bad enough. To avoid every human variable in X-ray work in The B. J. Palmer Chiropractic Clinic required that we build our own X-ray unit, cassette holder, bucky diaphragm, and other equipment more exacting than perhaps exist in any X-ray laboratory in Clinic use. To secure exacting straight lines in right angles to tube distances, we have metal base run-ways so cassette holders move forward and backward on roller bearing casters. That tubes may always be exactly at right angles to cassette holders, metal base run-ways placed parallel to metal base run-way of cassette holders, has been installed. That comparative exposures may be constant to first set, duplicated on second exposure in accordance with constant of first, that two sets may be correctly comparative, metal head and body and shoulder frame, lined and ruled, have been built and installed, that exacting posture may be duplicated for exposures.

PRECISION EQUIPMENT

To secure a known position, measurable in set figures, and at a later date reset the same known position to same figures as first position, is to secure a known comparative set of spinographs in all particulars. To secure this objective we builded a dual seat arrangement, a smaller revolving seat on top of a larger stationary base-seat. The larger stationary seat underneath is graded into degrees with lines to correspond to lines on the outer edge of smaller revolving seat above. In shifting case from one posture

to another (A-P to Diagonal) oftentimes case would shift torso more and legs less thus putting vertebral column into a torsion twist which would not be the same at subsequent exposures. To prevent this, a foot base is permanently attached to revolving seat above so that as one moves, other follows. This permits case to keep same posture and prevents spinal torsion twist changing from one posture to another. This builds a more perfect constant on spinographic posture. (See photographs.)

When variables can produce subluxations of vertebrae and curvatures of spinal columns, any of which can be manufactured or eliminated at will, then accidents can produce the same when carelessly exposed. To prevent any and all of this is the ultimate objective of our research to eliminate X-ray variables and establish X-ray constants in clinical X-ray technique. Much of this may seem trivial and costly to the careless worker, but it represents the difference to sick case between life and death, health or disease. (See Illustrations 9 and 10.)

Sit relaxed on ordinary stool. Bring feet backward and forward, spread them to center and outward, and relax at each change. Note changes in contour of spine. Sitting in natural position (determined by vertebral subluxation) feet assume a certain posture location. Correctly positioned exposed films are made and interpreted. Two weeks hence, comparative set is exposed. To what extent is posture same or changed? If posture is same, they will be comparative; if changed, they will not be. To have feet positioned forward in first and backward in second set, to turn toes outward in first and inward on second, is to change curves of spine. These different postures would not be com-

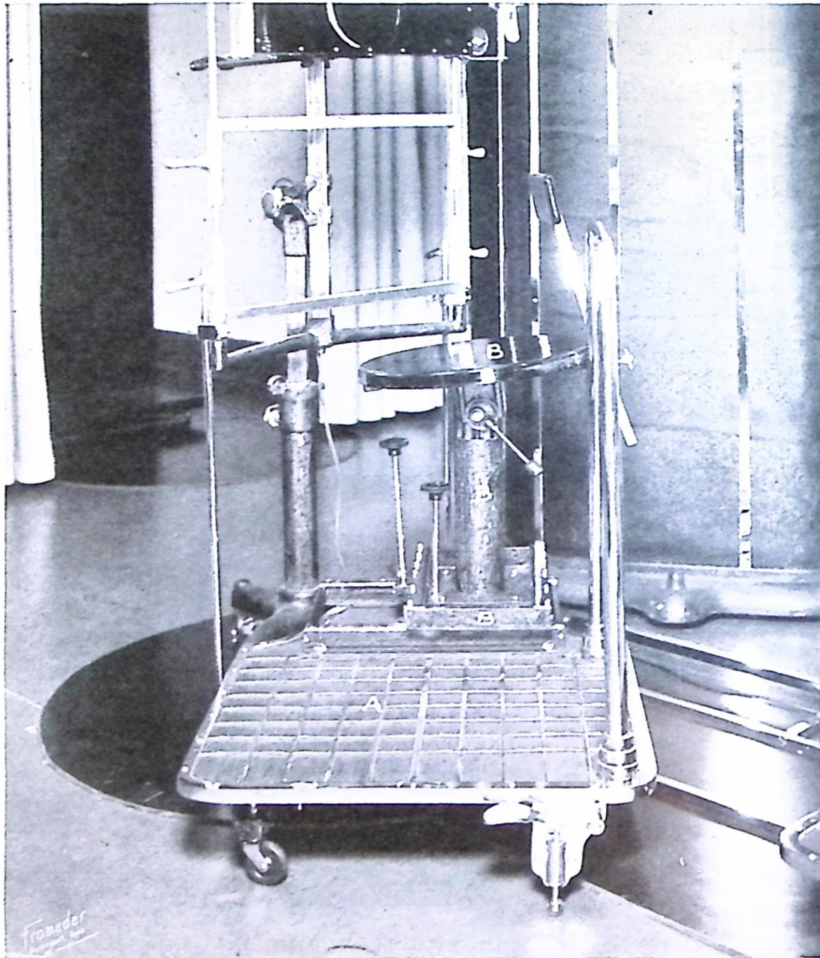


FIG. No. 13

Lower section of left unit. Seat shifted in opposite direction from photograph No. 10—entire seatbase shifted to right. Superior portion of seatbase shifted forward. Base unit at 45° angle for stereo spinographs.

parative. To lean left shoulder to right or vice versa would change comparative constants of posture.

In a successive series of check tests, a group were asked to sit on cassette stool, to relax, be composed, comfortable, be natural, and assume that posture which vertebral subluxation makes possible. No two placed their feet alike. No two had a constant to each other. Each had his own constant, there being no constant to all alike. Each was a variant to all others, altho a constant to himself:

- some placed their feet far back, others far forward
- some had toes together in front, some spread wide apart
- some had feet close together, others very much separated.

But we did find that when positions were tabulated and same person came back second time, he replaced them **somewhere near** where they were before. It is this constant to himself which must be **exactly** repeated at subsequent settings to secure **exactly same** constant to secure like comparisons in duplicate exposures. For that reason, the feet-guide-posture as illustrated. To lean head forward in one, backward in other, or at different angles to left or right at different times is to artificially permit case to create a variable out of one or other and change all conclusions, right or wrong. To prevent these, The B. J. Palmer Chiropractic Clinic has builded a posture record into exposure work. We illustrate it as best we can.

In conjunction with taking complete spinographic sets when case enters and making a final duplicate set day of

leaving The B. J. Palmer Chiropractic Clinic, we take comparative sets every two weeks. If one case were in Clinic ten weeks, there would be six sets of spinographic records in his file. In this Clinic, whether a case is or is not improving is of record. Each week, department after department, laboratory after laboratory retake findings, compare one week with another, and see what is happening. There is one department and laboratory that cannot check each week—X-ray. That is checked every two weeks. There is one reason for extra week lapsing in this department: Patient absorbs X-rays and must dissipate them before he can be given more. It takes some people longer to dissipate than others. One week would be long for some, and not long enough for others. Two weeks is great enough interval for all to be safe for amount of X-rays we use on any case in any sets we take.

To be “comparative” means to be otherwise **exactly alike** except for the particulars in which there **have been** a change; you desire no information on things alike, but you do seek information on things different. There are means to spinograph and that which is spinographed. “Means to spinograph” must **be alike**; that “which is spinographed” must prove a change. Externally, mechanical equipment must be **exactly alike** for all exposures. Internally, osteological changes must record the differences following adjustment. It is important that we have and use mechanical equipment so builded and constructed that we **are able to duplicate** mechanical set-ups to the most minute degree to prove differences osteologically to the most minute degree. This means to be able to reset mechanical parts tomorrow as we set them today, to eliminate any and

all minor mechanical movements to the end that spinographic film sets are mates, particularly stereos, except for allowing for whatever changes have been corrected under adjustment. Vertebral subluxations, major or minor, are minute in distance and degree of changed position. To have mechanical equipment which wobbles, vibrates, twists, shifts or permits patient to turn or squirm, permits mechanical movement greater than the subluxation we spinograph. This distorts and destroys the exacting constant comparative information sought. We have been compelled to build equipment, building in mechanical constants to eliminate all external variables. Illustrations and detail portray some idea of how carefully we protect this constant in our X-ray laboratories.

8" x 36" POSTURE CONSTANT EQUIPMENT

It is important that we spinograph occipito-atlantal-axial cervical region to locate abnormal position of atlas major subluxation. It is further important that we spinograph primary, comparative and final before-and-after 8" x 36" spinographs, all demanding a posture constant. The atlas area was exclusive so far as cause was concerned, but it was not inclusive so far as spinal column osteological abnormalities and controversial corrective methods were concerned in balance of spinal column.

Not one person in five hundred has a normal contour curved spinal column. Four hundred ninety-nine out of 500 exhibit hyper-curves, normal curves exaggerated, either anterior, posterior, or lateral; sometimes in combination with rotations. For every hyper or exaggerated major

adaptative curve there are corresponding hyper or exaggerated minor adaptative curves below. Not one person in a thousand has curvature, listed under names of lordosis, kyphosis, scoliosis, or rotary. Difference between hyper or exaggerated curves and curvatures is: normal curves hyper or exaggerated into abnormal curves are adaptative vertebral series of misalignment changes, following as chronic effects from major wedged-positioned atlas subluxation above; curvatures are normal curves made abnormal as result of trauma, anomalies or pathologies, the latter being direct chronic result of acute interference and generation of dis-ease caused by major atlas subluxation above.

Imagine a series of 24 two-by four's, 4 inches long, sitting squarely and evenly on top of each other into an upright column. Cut the second from top into wedge, with thin point edge either left or right, with blunt end on opposite side. It is observable that head (top one) leans low on thin-edged side and high on blunt-end side of wedge. Conceive, so far as blocks are concerned but not so far as spinal column is concerned, that blocks in series below have ability and power and do adapt themselves to equilibrium balance, both forward and backward as well as to either lateral side. If wedge point is left, and blunt end is right, head would be low on left. Blocks immediately below would be compressed, shortening left line separated on right, throwing curve out to right, out of plumb, giving a lengthened, hyper, or exaggerated right curve. Blocks immediately below those would adapt and adopt hyper or exaggerated abnormal curve with compression on right and expansion on left, and so on down the column—changes from side to side and/or forward to backward, and vice versa, being changed from normal

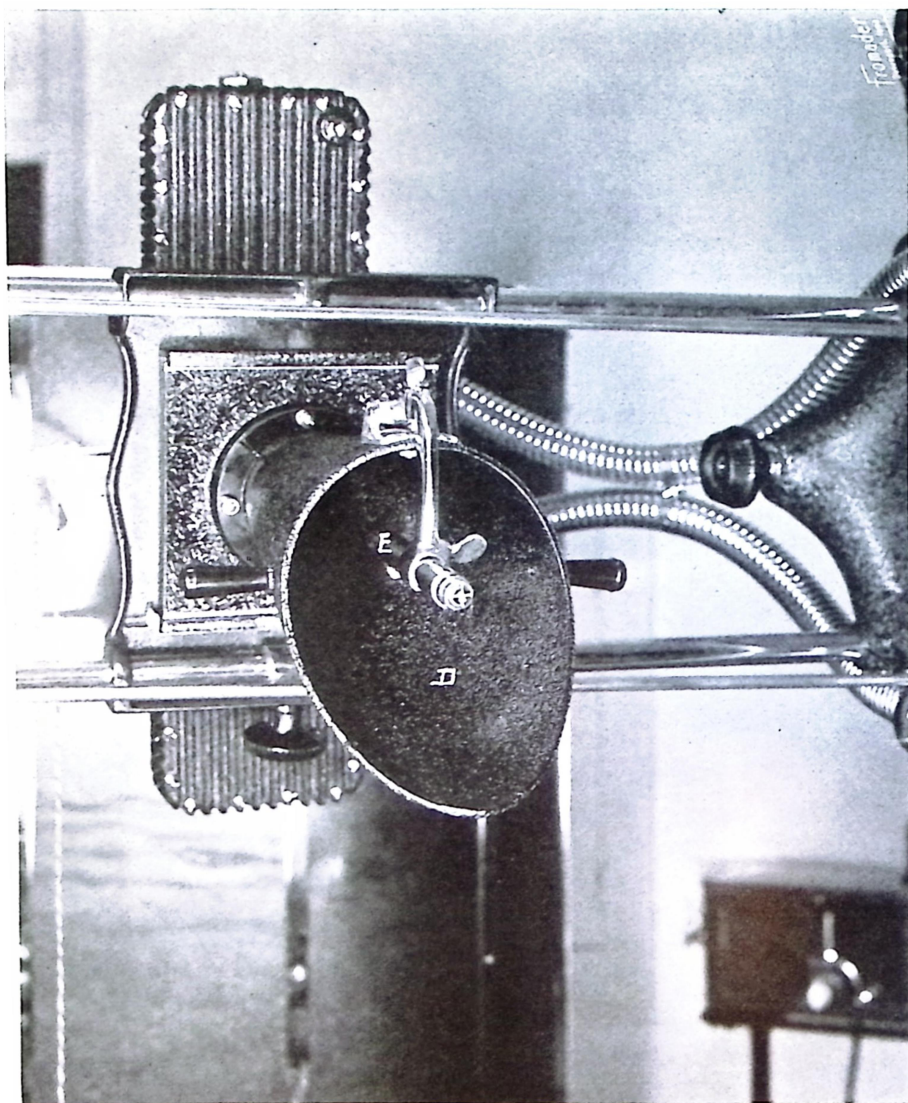


FIG. No. 15

Cone and electric flashlight equipment throwing pin-point light to ascertain exact and precise center of object spinographed. Tilts out of position out of cone when exposure is made.

adaptative equilibrium to **abnormal** adaptative hyper or exaggerated equilibrium curves because of the wedge above which throws all normal lines of normal balance into abnormal exaggerated abnormal lines of balance. To exaggerate a series of "S" curves is to shorten perpendicular length of series of blocks or individual carrying spinal column.

Adjustment of major wedge atlas subluxation above restores head to level, re-establishes entire spinal column to normal perpendicular equilibrium line of balance below, restoring normal length—if correctly and completely adjusted at proper place and times.

Above statement is inclusively or exclusively true or untrue. Whether such conditions could or could not be corrected below by adjustment of atlas major wedge-positioned subluxation above, was a mooted professional controversy. (This subject is extensively covered in Vol. 18. Palmer.) Such conditions existing below were observed, erroneously called "curvatures" and no discrimination was made between hyper or exaggerated normal-abnormal adaptative curves and traumatic, anomalous and pathological curvatures. That something needed be done to have hyper or exaggerated adaptative curves corrected is admitted by all. Three theories exist as regards correction:

- (a) Oldest group "adjust" each vertebra in a series of curves in a series misalignment, to correct its each and every position on the same premise of orthopedic surgeon, except that what he does with instruments and mechanical means, Chiropractor would try to do by hand pressure or manipulative treatment.

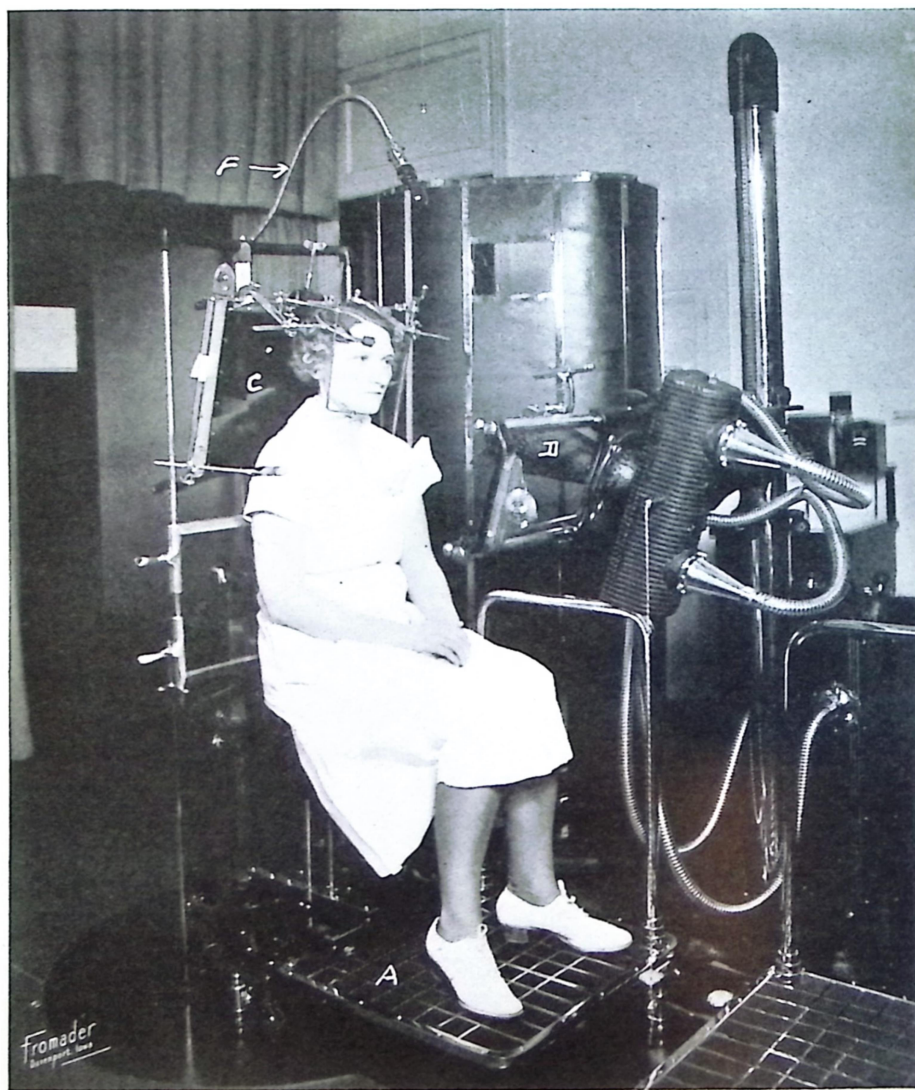


FIG. No. 16

Patient postured in precise posture-constant position for "before and after" A-P natural, lateral natural, or stereo spinographs, showing posture of feet, shoulders, chin, head, all of which is a matter of record which can be exactly duplicated. Posture-constant permeates every detail of this equipment. Patient is not shown with open mouth, altho that is our technique on some spinographs.

- (b) Next older group talked about ship being off keel with an unbalanced pelvis, shortened legs, and worked from lower end up.
- (c) Latest development along strict chiropractic lines is to adjust **the major cause** of wedge-positioned atlas subluxation—the upper end—letting all subsequent below adaptative effects of subluxation **correct themselves** in normal lines of equilibrium balance, once atlas wedge-positioned subluxation is adjusted.

To establish facts of relative merits or demerits of the three approaches to correction of this problem demanded scientific and laboratory proof beyond high-pressure salesmanship verbiages. This required before-and-after 8"x36" full-length single exposure spinographs showing hyper or exaggerated curves **before** adjustment of major wedge-positioned atlas subluxation, and corrections and absence of hyper or exaggerated curves **after** adjustment of major wedge-positioned atlas subluxation, proving its **exclusive** correction accomplished desired objective thruout entire length of spinal column.

This exacting proof demanded a posture-constant **for entire spinal column** spinographs. No X-ray table had been made or existed with that precision before-and-after comparative possibility. We had to make our own. Photo exhibits our table, leveled and squared, riding back and forth on track, with projecting adjustable arms to establish and fix patient's body to duplicate **preliminary** posture and spinograph with subsequent **final** posture, so graphs could establish facts as to changes occurring in spinal curves, abnormal to normal. As photos illustrate, it was also

built to be used in upright position where occasion necessitates, for radiographic work of other kinds.

Fluoroscopic unit illustrated is stock equipment and was not made especially by us for any exclusive Chiropractic use except for running track, leveled and squared, so it would give perfect and precise coordination with its table. A latter unit makes possible using it as an X-ray tube stand for posture-constant 8"x36" spinographic table as well as fluroscopic work when deemed necessary in establishing case histories.

ALLIED X-RAY CONSTANTS

It is wonderful that chemistry has been reduced to accurate constants so that we check our before and after adjustment conclusions and know that whatever variables there are, exist in patient and not in means used to ascertain those facts. Chemistry is a scientific constant. For that reason, we can and do prove variabilities in changes, from worse to better, in cases in our Clinic. If chemistry were a mass of variables and patient changed variables from bad to worse or worse to better, there could be nothing but a conglomerate mass of variables, both chemical and functional, from which each person would form empiric theories about what was taking place, and none could say him nay.

There are variables in all work, but it becomes the duty of a scientific worker, who desires facts, to eliminate every variable possible to be eliminated. One variable more difficult to eliminate is the electrical line-raise or line-drop. Our Clinic avoids this as much as possible by taking X-ray work at 9:00 to 11:00 A. M., or 2:00 to 5:00

P. M., when line potential is most likely to be constant day after day. There are constants in all work and it behooves the scientific worker to take advantage of them whenever and wherever possible. Every high grade X-ray film is made under a constant so that its value is a known factor year after year. Imagine disgust of a Chiropractor who would go to one store and demand a well-known and well-advertised brand of X-ray film and later go to another store and demand same well-known and well-advertised brand, only to find that it wasn't the same, was different—in one instance worked and in other failed. He and the patient would have good reason for being peeved. If both stores sold a manufactured constant, all customers would be pleased. No X-ray technician would keep switching from one film to another, once he settled on a high-grade film that delivers character of work he wants.

X-RAY UNIT AS USED IN THE B. J. PALMER CHIROPRACTIC CLINIC

X-ray units, made and sold on the market, are used to take one or two single radiographs, such as fractures, dislocations, prolapses of soft tissues, etc. Possibly at a later date, another radiograph may be taken to show fracture or dislocation has been "set," or stomach etc., has been drawn back into position.

Far more than that was demanded to meet exacting requirements laid down by Dr. B. J. Palmer. Over three years and \$15,000 have been spent to design, make and remake patterns, and manufacture sections to get this unit to do all and **exactly** what Dr. Palmer needed to produce the character of work this Clinic specified. Too much per-

THE B. J. PALMER CHIROPRACTIC CLINIC

X-RAY—EXPOSURE POSTURE CONSTANT RECORD

SHEET 2

Film No. _____

Case No. _____

Hour _____

Date _____, 19 _____

Name _____

A. P. VIEWS

STEREO _____

FLAT _____

Cassette angle _____ Height _____ Rotation _____

Tube Dist. _____ Height _____ Angle _____ Rotation _____ Position _____

Head left _____ Tilt _____ Angle _____ Right _____ Left _____

Shoulder left _____ Body rotation _____ Angle _____ Right _____ Left _____

Left heel _____ Toe _____ Right heel _____ Toe _____

Seat position _____ Left _____ Right _____ Front _____ Back _____

LAT. VIEWS

STEREO _____

FLAT _____

Cassette angle _____ Height _____ Tube Dist. _____ Height _____ Angle _____

Left heel _____ Toe _____ Right heel _____ Toe _____

Seat position _____ Left _____ Right _____ Front _____ Back _____

Body rotation _____ Angle _____ Right _____ Left _____

DIAG. VIEWS

STEREO _____

Cassette angle _____ Height _____ Tube Dist. _____ Height _____ Angle _____

Left heel _____ Toe _____ Right heel _____ Toe _____

Seat position _____ Left _____ Right _____ Front _____ Back _____

Body rotation _____ Angle _____ Right _____ Left _____

FULL LENGTH SPINE VIEW

FLAT _____

Cassette height _____ Tube Distance _____ Height _____

Remarks _____

FIG. No. 17

sonal credit and appreciation cannot be given to the tireless and indefatigable labor of Dr. P. A. Remier (PSC Commercial X-ray Laboratories) in staying everlastingly with it, working out and perfecting the insistent conditions demanded by the author.

Dr. Palmer demanded:

1. That spinographs **focalize** to occipito-atlantal-axial region.
2. That spinographs be brilliantly clear in sharp detail **without** distortion.
3. That entire spinographic sets of A-P Natural (1), Lateral Natural (2), A-P Stereo. (3-4), Diagonal Stereo. (5-6), 8x36 (7), be made to match each with the other with **perfect** precision.
4. That stereoscopic spinograph sets **match** line for line, blending one into the other without distortion, to portray true third and fourth dimension directions.
5. That entire set of seven spinographs of one person, made at previous date, precisely match an entire set of seven spinographs of same person taken at later date. Before-and-after sets are required to perfectly match without distortion.
6. That a posture-constant be established which could be mechanically duplicated, wherein future sets match past sets of same person.
7. That spinographs so made would be so perfectly matched that overlapping graphs could be made which would be true to prove changes in segments subsequently existing as the result of action previously adjusted upon segments analyzed in spinographs.

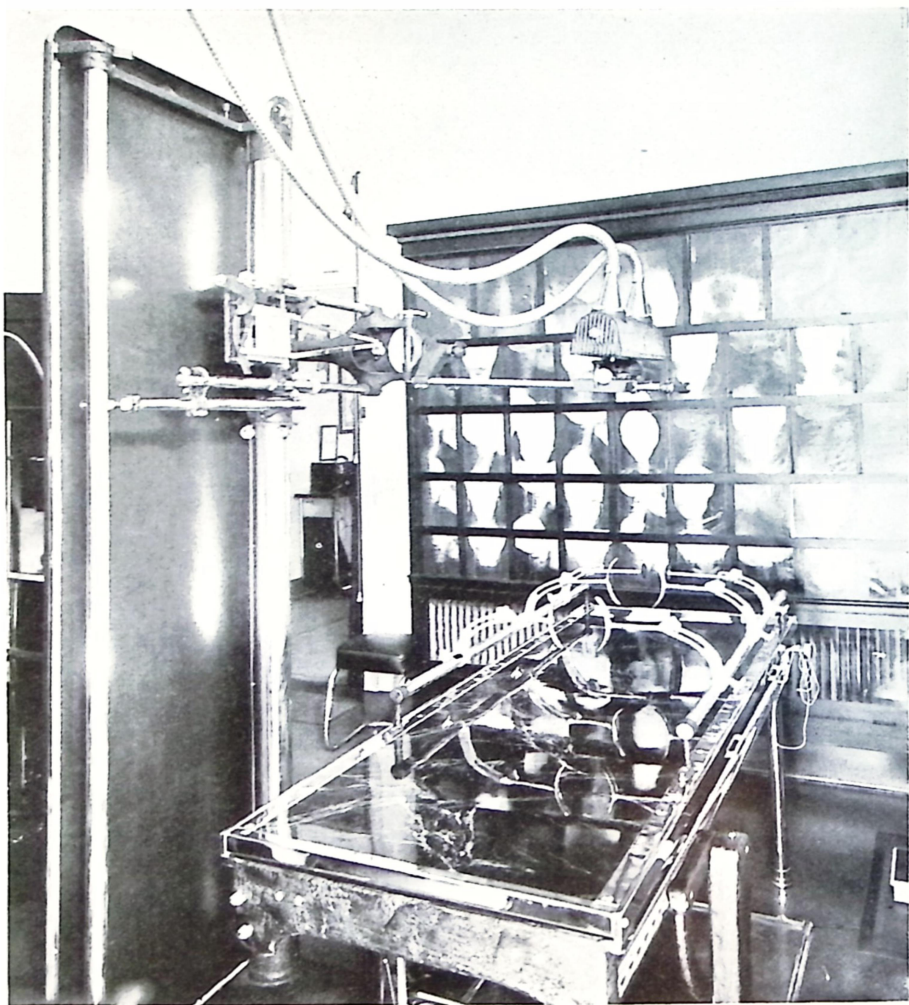


FIG. No. 18

In the text of this book we have given a description of the precise posture-constant 8"x36" exposure table. You will note extension arms which lock body into position, all of which is subject to measurement, thus making it possible to take "before and after" spinographs for comparative purposes.

The fluoroscopic upright table on left is used as a tube stand in making exposures for this table. Tube stand and table are in prone position for prone exposures.

Little of this was possible previous to manufacture of this X-ray unit.

Graphs were not possible because sets could not be matched. Sets could not be matched because before-and-after sets could not be duplicated with precision. Sets could not be duplicated with precision because there was no posture-constant established or possible. There was no posture-constant because equipment did not exist that could produce it.

It is the only set of its kind, having been entirely hand-made, and we doubt if it will be duplicated. Skill exercised in daily use is second to none, for we doubt if any X-ray laboratory insists upon "every detail done must be just exactly right, at all times, on all cases." Spinographs taken under this system now established are painstakingly yet naturally postured, exposed, developed, and interpreted.

This is, without question, the most precise and exacting X-ray unit constructed, assembled, and in use.

In this set of views we try to illustrate detail which makes all possible.

X-RAY COMPARISON INTERPRETATION VARIABLE. WE MAKE IT A CONSTANT.

Patient is sick. Vertebral subluxation is cause. **How** is subluxation malpositioned? **How** adjust it to correct its malposition? X-ray gives answers. Seeking X-ray information of directions of subluxation and adjustment seems simple and easy now that we know and do it. Once upon a time, those things were not known; as they began, they

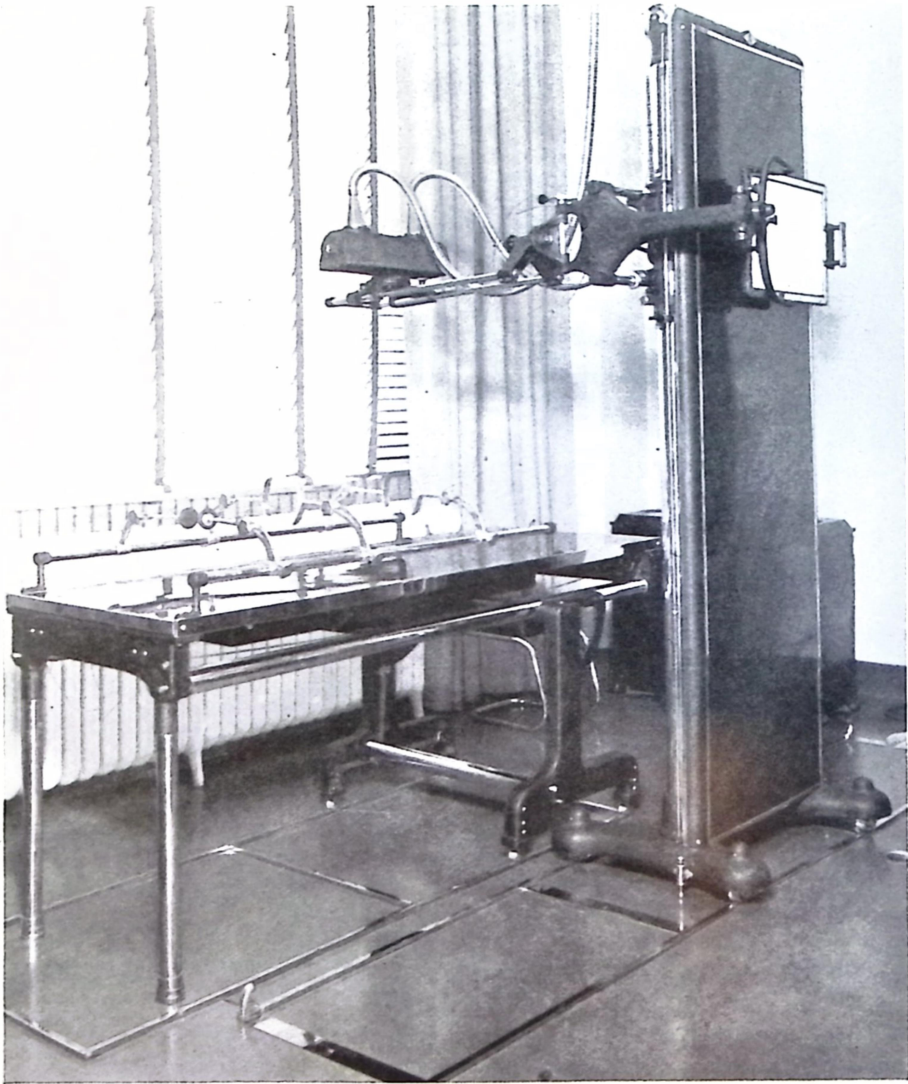


FIG. No. 19

Front left view, same table as photo No. 18, with fluoroscopic tube stand 8"x36" table again showing extension projection arms for assuming posture constant. Note also leveled and trued tracks on floor on which both units ride backward and forward. Upright table on right shows fluoroscopic set-up.

contained innumerable variables which had to be researched out and whipped into a constant. Today, X-ray work is a constant so far as tubes, current, exposures, films, developers, and interpretation are concerned.

To take one X-ray picture, analyze it, act upon information it reveals, is simple. Spinal columns need X-raying for detection of direction of subluxations, that we may know how to adjust from positions revealed. Spinographs were answer; our vertebral subluxation which had innumerable variables to be researched out and whipped into a constant.

That was not sufficient. The B. J. Palmer Chiropractic Clinic decided to get into the **before with** the subluxation, and **after without**, within the subluxation question. Some said, "There is no subluxation;" other said, "They do not move;" then again, "It wouldn't make any difference if they did, for they don't stay," etc. To follow thru with scientific proof introduced innumerable additional variables which had to be further researched and whipped into constants.

This called for two or more sets of spinographs—one taken before, others after—both sets of which must be comparative to each other. Anybody could take two spinographs at two different dates, **but to make them accurately and efficiently comparative** was difficult. Each person having spinographs taken assumes a posture. That posture was seldom twice alike. Posture could make or break, prove or disprove efficiency or accuracy of comparisons. If person assumed "natural" posture on one date and it revealed a certain type of subluxation, a week hence he could assume a careless changed posture (without adjustment) and sub-

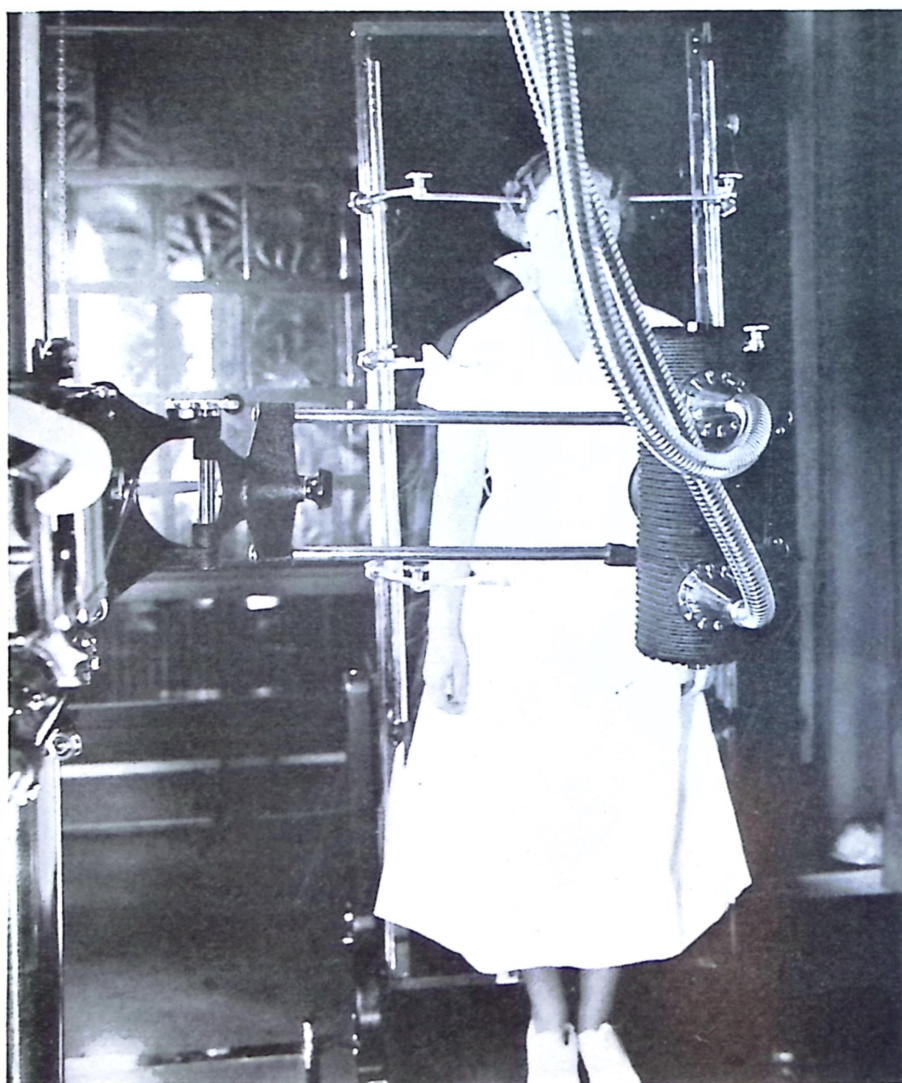


FIG. No. 20

8"x36" table, upright, shows extension arms in position on hips, shoulders, and head, preventing motion and assuming posture constant. Fluoroscopic table on left used in this pose as tube stand on 8"x36" single exposure films. All X-ray equipment is electrically shock-proof.

luxation did not exist or was different than previous date. One posture without subluxation, another change in posture with one; or, one posture with existing subluxation, change posture and be without one. Out of this grew necessity of development of a **constant of posture** (elsewhere described in this book) so that picture taken at one time under one posture could be **efficiently, accurately, and exactly duplicated**, not only in posture but in facts revealed any time hence. We eliminated posture variables. We builded a posture constant.

Before and after, under a constant posture, creates two sets of films. When comparative films were read by changing sets in one view-box or by having three sets in three view-boxes, there still existed difference of what two pairs of eyes saw or thought they saw; what two minds thot, or thot they thot as they shifted from one set to another. There was another snag of variables when more than one mind was seeing, reading, and interpreting. Was either right, or both wrong? It left everything to opinion, one thinking he saw this, another disagreeing. No problem is settled in accuracy, efficiency, and competency so long as it possesses variables or until the fact is a matter of record, comparisons established, proof offered, and variables are researched into a constant. **How** was it possible to establish a record of differences in what three sets of spinographs showed taken at three different periods, even though all sets were exposed under a constant posture? These problems we met and conquered. (See photo No. 22 of rolling seat in stereo reading room).

We secured a draughtsman's shadowless retracing table. Frosted glass top. High bright lights underneath.

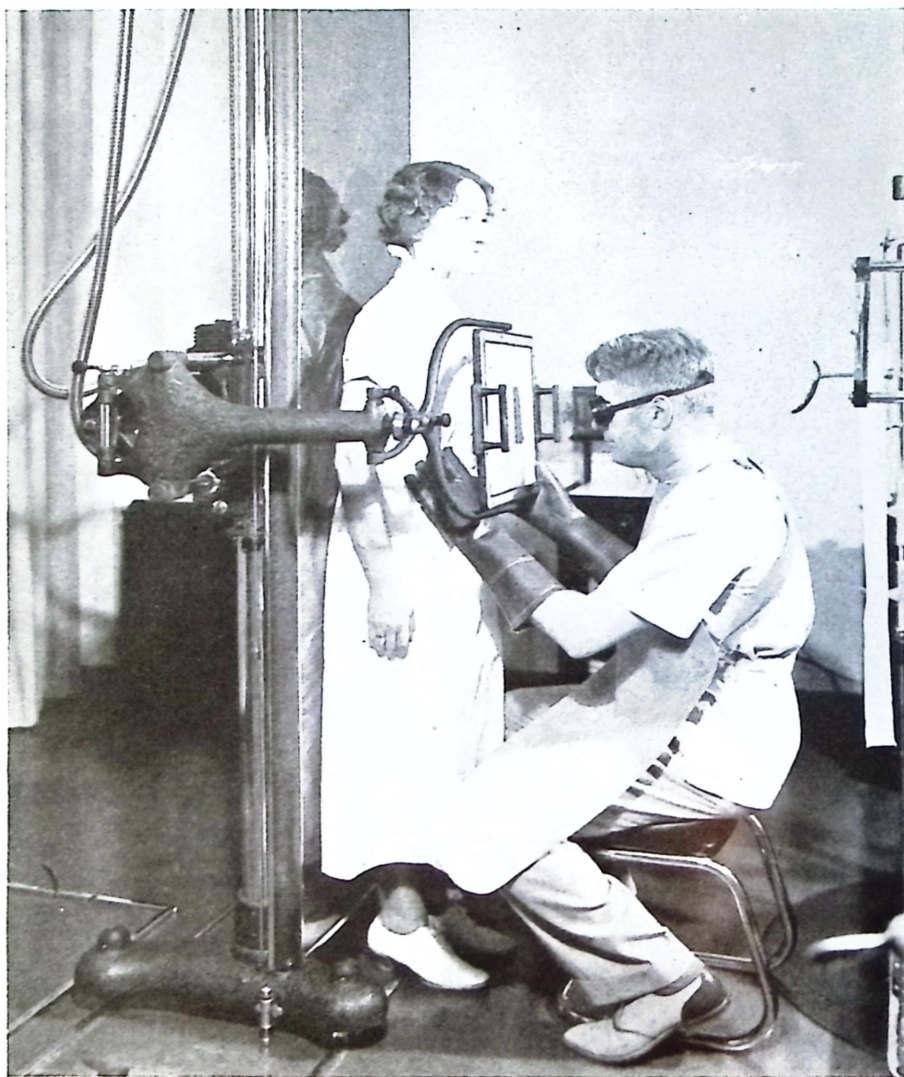


FIG. NO. 21

Fluoroscopic upright table in use. Note lead shielded eye glasses for observer, lead apron and lead rubber gloves to protect body of observer.

We placed A-P Natural spinograph (taken when case entered Clinic) on top of glass, placed fine ruled, squared, cross-section tracing paper on top of spinograph cut to size, so tracing paper assumed a constant position over spinograph. We traced high point landmark outlines of occiput, atlas, and axis on ruled squared paper. We did this with A-P Natural spinograph taken two weeks later after case entered Clinic. We took each comparative set with each successive spinograph of same set, of same person, different dates. At future times we could take other comparative graphs made in same manner, put traced graphs on glass, laying on top of each other, letting light shine thru, and see a change in position of one outline in comparison with other or others beneath. We had now established a method which could be consistently followed which eliminated variables in dispute, to a constant in which there was no dispute of correction of subluxation under adjustment. We took questionable, doubtful variables out of comparisons as different people looked in separate view-boxes, placed their graphs optically on top of each other in our retracing table, so all could and would agree seeing exactly what the constant was, at which they were looking. We builded an overlapping visual graph comparison and no matter how many looked, all would agree as to changes therein registered.

I look in one view-box at A-P stereo, then look at a subsequently exposed A-P stereo in second view-box, both being of same person, and think I see an improvement in side-slip wedge. You look at both sets and don't see any. It becomes a matter of differing opinion. I look at diagonal of same person, taken same time as A-P stereo, compare it with a subsequent diagonal, and to me I see improvement

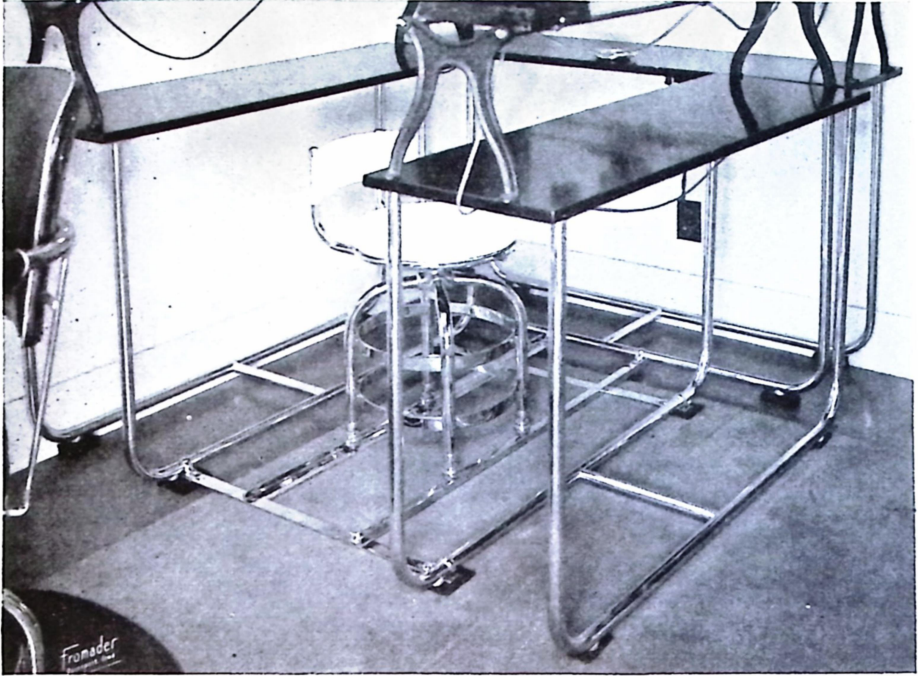


FIG. No. 22

In X-ray reading laboratory, we use three stereo reading boxes, that we might compare three sets of stereo films of three different periods simultaneously.

Example: Case A. Preliminary set, March 1st.

First check stereo set, March 15th.

Second check stereo set, April 1st.

Three stereo sets in three stereo reading boxes.

The purpose of this photo is to detail the ball-bearing, track-rolling, seat-rotating chair which permits reader to glide from one end of track to other, rotate from one stereo set to another, carrying a quick transition of visual memory from one set to another.

in rotation. You look and don't see it. Again it becomes a matter of differing opinion. Perhaps I am prejudiced because it is my case and I gave the adjustment. Perhaps my eyes honestly deceive me. Perhaps you are unbiased because your eyesight is keener or your analytical values more acute. But if we overlap one A-P graph over second A-P graph taken at a subsequent time, or if we do same with stereo graphs and they prove changed positions for better, then there is no doubt in either mind. The procedure is simple.

We cut tracing paper to size needed, 8x10. We laid two stereos (L and R) flat on glass, along side each other, made tracings over both, same as we did with single flats. We then placed graph tracings of set of stereos taken previously over graph tracings of set taken recently, and by permitting underneath bright lights to pass upward thru two overlapping sets of prints, we could prove correction of R. or L. wedge, and correction of rotation. Same was done to diagonal stereo tracings taken off diagonal stereos. If preferred, we could lay one former spinograph film over recent film, and get same effect; but we wouldn't have a visual **ruled graph** measured comparative record. This becomes a simple matter because of the constant in posture making it possible to overlap with comparative values.

Desiring to secure stereograph values, we could put two L. stereographed ruled outlines in R. box, and two R. stereographed ruled outlines in L. box, and see comparative values in stereo. In event there is no constant in posture and Chiropractor desires to take before and after spinographs, here is a suggestion that may help. Overlap certain landmarks such as jugular tips, using those as a

(Sheet 4)

THE B. J. PALMER CHIROPRACTIC CLINIC**CONTINUOUS SPINOGRAPH COMPARATIVE GRAPH RECORD**

Red, 1st date
 Blue, 2nd date
 Purple, 3rd date
 Green, 4th date
 Black, 5th date
 Brown, 6th date

Comparative graph between A-P Nat. spinographs taken 5-4-36 Case No. 113and 5-20-36and 5-26-36

and

and

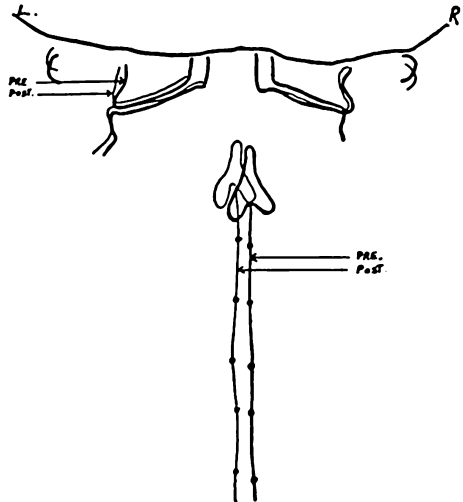
Major: Atlas ASR - R. Jones. Post.Adjs. given:
(Dates)5-5-36

FIG. No. 23

constant, and then graph differences in position of atlas, etc. By overlapping graphs made in this way, it may help, even tho it is not as accurate as described constant posture.

We continued before-and-after comparison spinograph sets, graphing one on top of other, changing color of additional graph drawings so we now can have six tracings on one paper, each differently colored, showing the different changed positions from one date to another; six sets of spinographs of six periods of evolution of adjustment of subluxation and its replacement to normal. It is highly illuminative to comparative graphology.

WE GRAPH CURVES

A wedge positioned atlas tilts head; as a result, adaptive curves in balance of spinal column including pelvis. An adjustment of atlas major wedge subluxation straightens head, squares spine, and levels pelvis, given time, for adaptation to rebuild. (See Vol. XVIII, Palmer.) To establish before and after 8x36 facts, we have been taking 8x36 spinographs of every case upon entering and leaving our Clinic. It becomes a simple matter to make graph tracings of before films, and compare them with graph tracings made from after films when case leaves Clinic, showing correction of curves. These tracings overlap each other on top of glass lighted desk. It offers proof of correctness of atlas major adjustment.

The posture-constant X-ray equipment was a new requirement, more exacting than any previous demand made in X-ray work. Usually a one-time picture is all that is needed to serve the average radiographer's conditions.

Later came stereoscopic spinographs; the duplication of same patient, same sitting, shifting tube. This required perfect balance between two pictures, neither of which could be out of perfect alignment, otherwise the two spinographs would not blend into each other.

Later still, in our Clinic, we demanded stereoscopic pictures of one date to be perfectly matched with another stereoscopic set taken at a latter date, which might be one week, two weeks, six, eight, or ten weeks hence; one set of which had to perfectly match any or all other subsequent sets. No X-ray equipment was so made that this could be done. We then proceeded to manufacture for our own use, such an equipment that would and did deliver us a posture of the patient which **exactly** duplicated former position. We called this the "posture-constant."

Duplication of posture-constant makes possible certain fixed land-marks which are the same at all times, regardless of difference in time when taken, which then establishes duplication of fixed osteological land-marks from which we establish our subluxeation-graph and adjustment-correction-graph system or method of comparison of one spinograph with another, one date with another.

The subluxeation-adjustment-graph, once established according to a series of constants, fixes the fixed portions and proves vertebrae that have moved—which way, how much and whether in the right or wrong direction—following any adjustment, etc. It reveals to the eye what has changed. It reveals, subject to actual measurement, how much the subluxeation has been corrected in position. It eliminates what the eye thinks it sees, what the mind thinks

it remembers. It puts subluxation-adjustment within the realm of physical science.

The graph once efficiently; correctly, and accurately established, makes possible blue print copies which can be duplicated cheaply, which can be given to patient or sent to Chiropractor who referred case here for study purposes. Best of all, it permits us to study changes from date to date as they overlap each other, to determine value of one adjustment given one way as against another adjustment given another way, and thus accurately the health value of each. It determines correction value of an adjustment as against destructive value of some types of technique salesmanship.

We produce a set of graph blueprints. They are not subject to perfect analysis as you see them. Original graphs of before-and-after sets are made on special oiled graph paper. Each set is produced in colored India inks. Red is the first set, then blue, purple, green, black and brown. The best we can do here, in reproduction is to label them "Pre"; "1"; "2"; and finally "Post." If you can pick out the continuity of vertebrae as of each set, you can see how the complete overlapping graph shows changes which have occurred in a typical case. For purpose of illustrating the idea, we have carried one actual case thru this series. Cuts are made from original graphs. Difference in shading of lines is because of different color values in original as transferred. We hope you understand them.

OCCIPITO-ATLANTAL-AXIAL CONSTANTS AND VARIABLES

One fundamental constant which requires broad Chiropractic understanding is normal osteology. It is not uncommon to find Chiropractors trying to fit an atlas upside down under an occiput; or perhaps turning it right side to. Rarely, however, could one get an axis wrong side, or upside down. In discussing articulations of occiput, atlas, and axis, all Chiropractors have a "fair" understanding, which is not sufficient when one specializes in spinal columns, vertebral subluxations, and adjustments, where detailed intimate knowledge must be had of intricacies of exacting articulations. A Chiropractor renders only ordinary Chiropractic service unless he has a very intimate and exacting knowledge of intricacies of articulations of normal osteology, especially between occiput, atlas and axis. He must know normal as well as great number of variations from that normal into field of abnormals.

Thruout the many osseous articulations between occiput, atlas, and axis, there runs a common constant. That constant prevails whether it be with one person or a million; whether they be white, black, yellow, or red skinned; whether they be fat or lean, tall or short, healthy or sick; whether they be normally positioned or subluxated.

ANATOMICAL CONSTANTS

The anatomical constant or normal articulations between occiput and atlas, as described in Palmer's Anatomy, is:

(Sheet 1)

THE B. J. PALMER CHIROPRACTIC CLINIC

CONTINUOUS SPINOGRAPH COMPARATIVE GRAPH RECORD

Red, 1st date
Blue, 2nd date
Purple, 3rd date
Green, 4th date
Black, 5th date
Brown, 6th date

Comparative graph between A-P Nat. spinographs taken.....S-4-36..... Case No....113.....
and.....S-20-36.....
and.....S-26-36.....
and.....
and.....
and.....

Major: Atlas ASR - R. Trans. Post.

Adja. given:
(Dates)

S-5-36.

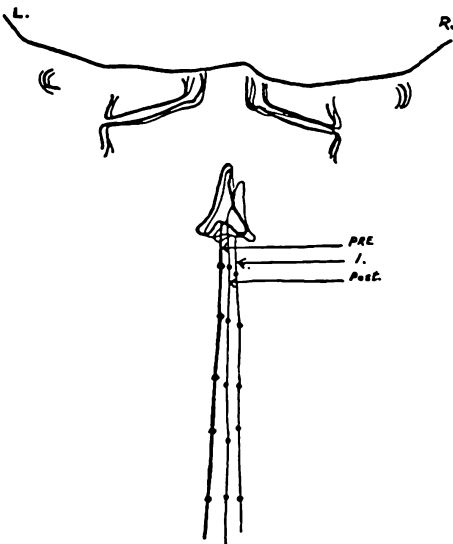


FIG. No. 25

"The Occipito-Atlantal Articulation is a diarthrodial joint also a ginglymo-arthritis and condyloid joint. It is formed by the condyles of the occipital bone and the articular processes of the atlas."

The anatomical constant or normal articulations between atlas and odontoid, as described in Palmer's Anatomy, is:

"The Atlantal-Odontoid Articulation is a diarthrodial joint, subclassified as a pivot joint. It is formed between atlas and odontoid process of the axis. The transverse ligament which is a very important one, stretches between the tubercles on the inner surface of each lateral mass of the atlas. This ligament divides the spinal foramen into two portions: the anterior part contains the odontoid process, and the posterior the spinal cord and its membrane. The synovial membrane is situated between the odontoid process and the anterior arch of the atlas."

The anatomical constant or normal articulations between atlas and axis, as described in Palmer's Anatomy, is:

"The Atlanto-Axial Articulation is a diarthrodial joint, subclassified as an arthrodial or gliding joint. It is formed between the articulating processes of each vertebra."

The anatomical constant or normal articulations of atlas in relation to occiput above and axis below, as described in Cunningham's Anatomy, Fourth Edition is:

"The Atlas or First Cervical Vertebra:—This bone may be readily recognized by the absence of the body and spinous process. It consists of two lateral masses, which support the articular and transverse processes. The lateral masses are themselves united by two curved bars of bone,

(Sheet 2) **THE B. J. PALMER CHIROPRACTIC CLINIC**
 DUAL SPINOGRAPH COMPARATIVE GRAPH RECORD

(In this graph only two spinographs will be compared, first upon entering and last upon leaving, skipping any between.)

Comparative graph between Lat. Nat. spinographs taken.....*5-4-36*..... Case No.....*1113*.....
 and.....*5-26-36*.....

Stud. entering date

Stud. leaving date

Major: *Atlas - A 5R-R. Trans. Post.*

Adjs. given:

(Dates)

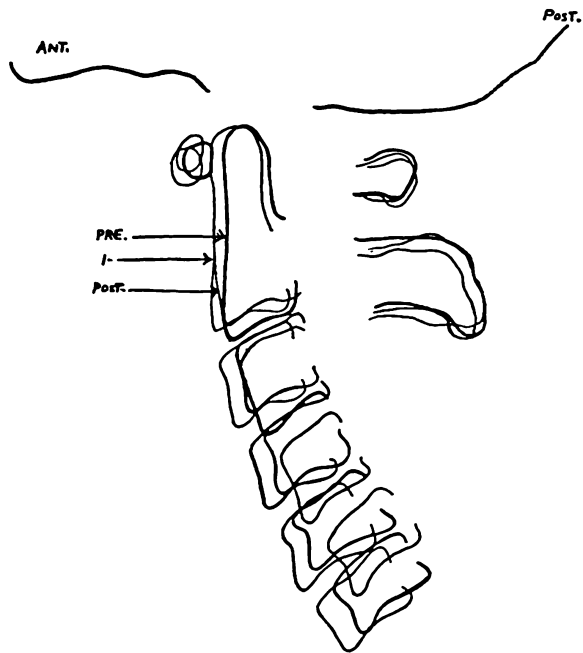


FIG. No. 26

the anterior and posterior arches, of which the former is the stouter and shorter. Each lateral mass is irregular six-sided, and as placed that it lies closer to its fellow of the opposite side in front than behind. Its upper surface is excavated to form an elongated oval facet called the fovea articularis superior, which is concave from before backwards, and inclined obliquely medially; not infrequently this articular surface displays indications of division into two parts. These facets are for the reception of the condyles of the occipital bone.

"The fovea articulares inferiores (inferior articular facets) are placed on the inferior surfaces of the lateral masses. Of circular form, they display a slight side-to-side concavity, though flat in the antero-posterior direction. Their disposition is such that their surfaces incline downwards and slightly medially. They rest on the superior articular processes of the second cervical vertebra or epistropheus. Springing from the anterior and medial aspects of the lateral masses, and uniting them in front, is a curved bar of bone, the arcus anterior (anterior arch); compressed on either side, this is thickened centrally so as to form on its anterior aspect the rounded tuberculum anterius (anterior tubercle). In correspondence with this, on the posterior surface of this arch is a circular facet (foveo dentis) for articulation with the dens of the epistropheus."

The anatomical constant or normal articulations between atlas and odontoid, as described in Cunningham's Anatomy, Fourth Edition, is:

"Epistropheus or Second Cervical Vertebra:—This is characterized by the presence of the tooth-like dens (O. T. Odontoid process) which projects upwards from the

superior surface of the body. Slightly constricted where it joins the body, the dens tapers to a blunt point superiorly, on the sides of which there are surfaces for the attachment of the alar ligaments. When the atlas and epistropheus are articulated this process lies behind the anterior arch of the atlas, and displays on its anterior surface an oval or circular facet which rests on that on the posterior surface of the anterior arch of the atlas. On the posterior aspect of the neck of the dens there is a shallow groove in which lies the transverse ligament of the atlas, which holds it in position."

The anatomical constant or normal articulations between occiput and atlas as described in Cunningham's *Anatomy*, Fourth Edition, is:

"The lateral (or exoccipital) parts of the occipital bone are placed on either side of the foramen magnum; on their under surface they bear the condyli occipitales by means of which the skull articulates with the atlas. Of elongated oval form, the condyles are so disposed that their anterior extremities, in line with the anterior margin of the foramen magnum, lie closer together than their posterior ends, which extend as far back as the middle of the lateral borders of the foramen. Convex from before backwards, they are skewed so that their surfaces, which are nearly plane from side to side, are directed slightly laterally."

How young or old must a human be to get a subluxation? No period of human life is exempt from production of such. There is no constant, subsequent to birth, below which none exists. Babies, youth, adults have them. Older children and adults usually exhibit some form of anomalous, pathological and/or traumatic osteological

growth, true or false, in the occipito-atlantal-axial region, which younger children and babies usually do not exhibit. Subluxation precedes anomaly, pathology, or traumatism. It is the opinion of the writer that majority of major atlas subluxations occur at childbirth, some in early youth, and older we grow, less vertebral subluxations we produce, nothing preventing any which we do carry being made worse at any time. Reverse is true of anomalies, pathologies, and traumatic conditions. They grow worse as years go on. The average prospective mother carries vertebral subluxation from early youth, possibly birth. With motherhood, she becomes less able to carry added responsibility. Modern educated artificial life has made child-bearing a nuisance, costly, difficult to have, and physical torture for mother and child. With hospital service demanded, physical straining and struggling to give birth demands painful and forcible deliveries necessary. Children are born with heads and neck twisted and distorted with subluxations at birth. Children are sometimes born with, but most are created at birth. With variable subluxation existing at birth, it is easy to account for abnormal cartilaginous ossifications in variables we detect in spinographs.

The total skeletal ossification has a constant. One half of body does not develop exactly like its opposite. A tailor or dressmaker cannot fit one side like the other; a glove-fitter, or shoe-fitter knows both hands or feet are different; a barber is aware both sides of face are not same; an oculist knows both eyes are different; an aurist knows both ears don't hear alike. One-half of our skeletal frame-work does not ossify like its mate. We are unilateral in ossific development because we suffer from birth-dated

THE B. J. PALMER CHIROPRACTIC CLINIC

FIRST DAY DAILY CASE REPORT RECORD

Case No. _____

Date _____

REMARKS

In the majority of cases, when you get your daily NCM check, we will hand you a blank "Daily Case Report Record." Watch your progress, note any and all changes, mention them, returning filled out blank next day when you come for daily NCM check. If you are getting better or you think getting worse, mention each in detail.

Each time you receive an adjustment, which we hope won't be often, check the following four conditions:

1. Did you notice your head felt clearer as tho a load had been lifted? Yes. No.
2. Did you feel a warm glow over body, especially hands and feet? Yes. No.
3. Was there a tired feeling of lassitude, exhaustion afterwards? If there is, rest as much as you can, the more the better, for it is during such periods repairing, rebuilding and recuperation are working at their best. Yes. No.
4. Did you feel a slight hunger, not great, but some, after adjustment? Yes. No.

Rest rooms are for necessity and convenience. NECESSARY for one hour or more, not less, after each adjustment. CONVENIENCE on other days on which an adjustment is not given, should you feel sick, tired or desire to rest.

How to rest following adjustment. We have just "set" a vertebra that WAS out of alignment. You will get well with speed according to the length of time it stays in position. Don't twist, jerk, wrench or suddenly rotate neck or head. Use caution and care. This applies to all the time you are here but more particularly after an adjustment. Get up from bed carefully, etc. In resting, lie on back, head not on any strain, but relaxed. Preferably go to sleep if you can. This will HELP set adjustment more firmly and permanently.

Use NO opiates, sedatives, hypnotics or stimulatives such as aspirin, adrenalin, arsenic, bromides, allonal, insulin, diet, etc., while in The B. J. Palmer Chiropractic Clinic. It destroys accuracy of NCM check readings, makes it impossible for us to render efficient service for which you are paying. If in doubt on above, ask Director of Clinic for specific application to your case.

Getting well is a 50-50 obligation our Clinic owes you and you owe yourself. Our advice is based on that assumption. We will liberate all energy you use. We give but you must utilize.

Desiring information regarding your case, ask Secretary for appointment to interview Director of Clinic. The Director of the Clinic (Dr. B. J. Palmer) will discuss your case any time AFTER the FIRST day but he cannot give you anything definite in conclusions until after due study of comparative observations have been compiled and studied.

If anything, be ahead of time for all appointments. Please hand Secretary your local address and phone number so she can reach you if occasion arises.

The P.S.C. maintains a lunch room in The Administration Building next door to The B. J. Palmer Chiropractic Clinic where meals can be obtained.

Signed _____

FIG. No. 27

anomalies which develop anomalous abnormalities in osseous growth in every two bones on opposite sides. While that is an internal-abnormal constant, it is also a unilateral internal variable with everybody. Allowances must be made in our interpretation of differing osseous shadows in spinographs.

An anatomical vertebral constant is followed in sequence by normal functional transmission constant. An anatomical vertebral variable is followed in sequence by vertebral subluxation, functional variable, disease variable. The purpose of knowing anatomical vertebral constant is for Chiropractor to understand and make possible by adjustment a subluxation variable back to its anatomical vertebral constant, changing functional variable to functional constant, disease variable back to health constant. The purpose of seeking any constant in The B. J. Palmer Chiropractic Clinic is to know the constant before subluxation, its correction after subluxation, to trail forward and backward health from constant to disease and its variables and return backward over the trail from disease variables to health constant, none of which would be best attained without that knowledge.

When anatomical and functional constant is present, following sequence exists:

- (a) normal neural or intervertebral foramen
- (b) normal transmission in, over, or thru spinal cord or spinal nerves
- (c) transmission of normal quantity and quality of mental impulse supply
- (d) no resistance on the path of transmission

- (e) normal rate of speed of action at periphery of that or those nerves
- (f) health is the functional equivalent constant.

When anatomical and functional constant are absent, following variables exist:

- (a) occlusion of neural or intervertebral foramen
- (b) pressure upon spinal cord or spinal nerves
- (c) interference to transmission of normal quantity of mental impulse supply
- (d) resistance on path of transmission
- (e) lowered rate of normal speed of action at periphery of that or those nerves
- (f) disease is equivalent functional variable.

In observation of thousands of specimens of osseous articulations between occiput, atlas, and axis, there runs a stream of variables from those constants in which no two are alike. Variables prevail more or less between every two people. That constant and those variables must be known in specimens of different people if they are to be read in spinographs in different sick people as they present themselves. That constant and those variables must be known as to their normal articulatory position in different people if Chiropractor is to read spinographs of different people as subluxations are presented. If condyles and atlas are in perfect apposition, that is an anatomical articulatory constant. If atlas is subluxated from condyles, that is an anatomical articulatory variable. If, in addition to being subluxated, it possesses some anomaly, pathology, or traumatism, it possesses more than an anatomical articu-

latory variable. Added to that is or are the additional variables which must be read into spinographs when studying for correct interpretation of subluxation.

Three types of variables may be, can be, and are frequently noted in vertebrae:

Anomalies, brot about by differing quantities of cartilaginous ossification in youth which become fixed factors in adult life. There usually is no pathology present. Ossification is bi-lateral, each half having osseous expansion development independent of each other. One side may grow fast, other slow; one much, other little. Ossific centers are a constant but expansion quantity per time comparison may vary considerably. Unless such are recognized and allowed for, spinographs could easily be read wrong. Care in study is demanded to determine such, make allowances for them.

Pathologies, breaking down of tissue continuity can change size, shape, and position of sections or all of one vertebra or corresponding articular facets matched of two vertebrae. Caries, necrosis, tuberculosis of bone or osteomalacia can soften hard structure and cause it to be misshapen due to gravity pressure of weight above. Peculiarity of shapes such may assume might shift conclusion of direction of major subluxation. Care must be exercised in seeing and allowing for each in spinographs.

Traumas, fractures with osseous symphyses building cicatrixal deposits form shadow lines which would mislead conclusions on constants in spinographic readings. There is rarely pathological variable with these and because of absence would optically appear as a constant.

Occasionally we have pathology variables in one stage of time followed by trauma variables, or vice versa. In such rare instances, allowances must be made for history of dual classifications of variables in reading spinographs.

It is one thing to have a common run of superficial knowledge of occiput, atlas, and axis, and quite another to be a spinal column, subluxation and adjustment specialist in the full sense, by stepping up concepts of broad knowledge of normal and abnormal, normal positioned and subluxated vertebrae, with constants and variables in thousands of specimens, to know **how** each applied to each living subluxated person.

18,100 OSTEOLOGICAL SPECIMENS

The B. J. Palmer Chiropractic Clinic, in its Osteological Laboratory, has a collection of 18,100 osseous specimens. These have been intimately and carefully studied, catalogued, histories written, and tabulated. Thousands of occiputs, atlases, and axes. They have been gathered from the four quarters of the earth, from tombs of ancient Egypt to Mound Builders, from black and white, down to modern days; from this and other countries. These make possible that broad necessary knowledge of those constants and variables that do exist in our specialty of vertebral columns and their individual areas when subluxated and adjusted. This collection has the reputation of being the largest and finest, anomalous, pathological, and traumatic osteological laboratory in the world.

If occipital ossification was normal, each side of head would be equal in quantity, deposition, etc. Occipital protuberances have variables:

- one side may be long from above downward, other short
- one side may be short and thick, other long and thin
- one side may be entirely absent, other present
- one side may be flattened thru caries, necrosis, osteomalacia, etc.
- one side may be fractured and displaced, other may be normal.

These variables should be observed, discerned, eliminated, or rebuilt into the constant in your mind that the eye may not be deceived when they are taken as landmarks from which to ascertain plane line for side wedge subluxations of atlas.

CONDYLAR VARIABLES

Condyles, like all other arbitrary divisions of anatomy, have variables:

- some are flat, others concave, others very concave.
- some are bisected with flat on one half and concave on other half.
- some slope obliquely towards middle on anterior; others slope obliquely towards middle of posterior.
- some dish in toward center, without concavity; other dish outward towards laterality without laterality.
- some are very broad on articular surfaces; other are very narrow.

- some go to a point toward anterior and very broad on posterior; others are reverse.
- one condyle is located more anterior on rim of magnum foramen than other. This would fool a spinographer unless he knew it did and could happen. It does exist in some “failure” cases.
- one is long anterior-posterior, other is round, making it shorter in diameter line A-P.
- sometimes both are built up as on a peninsula. This might be an anatomical constant to one individual but it is not an anatomical constant to all people. It isn’t usual, therefore could be classified as a natural variable.
- one condyle might be laterally a distance away from foramen magnum, other on normal border. This condition, if, as, and when existent, would fool interpretation of atlas subluxation in a diagonal stereo if he didn’t know it could and should be reckoned with by negating it in his calculations of spinographs.
- some present healed fractured lines on articular surface; majority do not.
- some have been flattened by osteomalacia and flattened in various possible directions, thus decreasing thickness from above downward.
- some present true exostosis at various locations surrounding edges of articular surface or surfaces; most do not.
- some present false exostosis on outer lateral rims formed of material squeezed out by softening.

- some exostoses, true or false, form an osseous lock and limit motion of subluxation, restrict action in adjustment, thereby lengthen time to correct until such has been chemically dissolved by Innate.
- some articular surfaces show a high degree of polish by attrition because of being denuded of any bursa brot about by friction with mates below bringing bone to bone contact.
- some present various combinations of osseous locks, on one side or other, or both; some one place, some another.
- sometimes an entirely new facet, on one side or both, over old one or sometimes in a new location, formed of new osseous material (true exostosis) pilastered on top of old facet. This may elevate occiput on that side or seemingly lower it on other, giving false conclusion in reading spinograph unless it was observed and taken into account.
- some are ankylosed with atlas below, altho this is rare; when it is, rarely is axis ankylosed.
- some are born fused with atlas, there being no line of demarcation; this also is rare.
- some have dual articular facets on each superior side, creating four facets on superior of atlas instead of two. Each side is sometimes deeply indented like a V. In such event, condyles could not rotate anterior or posterior on either side on atlas. If rotation was thot to be observed in spinographs, it would be explained by some other mal-position of some other articulations.

—some are eaten away, on one side or both, in part or entirety, by caries, necrosis, tuberculosis, osseous sarcoma, or syphilis, etc. This seriously affects position and direction of subluxation and adjustment. All this can be seen in spinographs if it is anticipated and rarely arrives, but recognized when it does appear.

The anatomical constant quoted, amidst possible anomalous, pathological and/or traumatic variables given, does exist regardless of what abnormalities present themselves. This constant, amidst variables, is true, whatever condyles present the co-respondent articulations on atlas below correspond in like characteristics and offset it in like kind. In reading spinographs of condylar articulations, it is a constant to remember that what is above is also below, except in reverse direction and character. With that constant in mind, variables will not confuse.

It would be superfluous to repeat above in reference to superior atlas articulations with condyles.

ATLAS POSTERIOR ARCH VARIABLES

The anatomical constant is best described as follows:

“The posterior arch arises in part from the posterior surface of the lateral mass, and in part from the posterior root of the transverse process. Compressed from above downwards anteriorly, where it bounds a groove which curves around the posterior aspect of the superior articular process, which groove is also continuous laterally with the foramen transversarium, the posterior arch becomes thicker medially, at which point it displays posteriorly a rough

irregular projection—the tuberculum posterius (posterior tubercle), the feeble representative of the spinous process. A prominent little tubercle, arising from the posterior extremity of the superior articular process, overhangs the groove above mentioned, and not infrequently becomes developed so as to form a bridge of bone across it, converting the groove into a canal through which the vertebral artery and the posterior ramus of the suboccipital nerve pass—a condition normally met with in many animals. It is noteworthy that the grooves traversed by the two highest spinal nerves lie behind the articular processes, in place of in front, as in other parts of the column.”

(Pages 91-92, “Cunningham’s Text-Book of Anatomy,” Fourth Edition, Edited by Arthur Robinson, M. D., F. R. C. S.—Ed.)

Atlas posterior arch is important because Chiropractors use it as a comparative landmark to ascertain rotations of atlas in articulation with condyles above or axis below. It contains variables which would fool average person:

- some posterior arches portray fractures at root of pedicles, or at point of union posteriorly. Usually occur in youth. Where attended with dislocation of segments, they are misleading to use as a landmark. Sometimes there are overlapping segments at posterior union.
- some are ununited, a spina bifida, all otherwise normally developed. Posterior arch spina bifidae may be heavy or slight in build, usually are small and diminutive. Care must be exercised in this variable to not take either side shadow as a base for rotation comparison.

- some have caries, necrosis, osteomalacia, or tuberculosis of bone substance which may be confined to one side or other, or both.
- some have exostoses builded on posterior superior portion which it may have articulated with occiput, or on a lateral half where superior surface may have done same, or on inferior center surface where it may have articulated with superior surface of spinous process of axis. This would be vital if determining superior or inferior subluxation of atlas in lateral spinograph.
- some are longer on one lateral half, shorter on other, uniting it presents a distorted growth. This misleads determination of rotation. It is a variable that happens frequently.
- some have well developed tip on posterior located to right of median line, others to left. Care should be exercised to pre-determine this fact before exercising snap judgment as to rotation.
- some posterior arches, at center tip, have well developed spinous process and is often mistaken for axis. It would seem easy to not make this mistake.
- some posterior surfaces, at location of tip, are thick above downward and have marked indentations, concave broad surfaces, creating distinct shadows in spinographs which blend with other shadows more anterior which are misleading. This variable happens frequently. Others are thick from above downward and project to a thin lip creating practically no shadow.

—some have marked intervening open spaces between center point of union of two lateral growths creating dual shadow on spinographs making it difficult to use either as a guide in comparison with axis below determining rotation.

—some posterior arches have developed unlevel, low on one side, high on opposite, which in a spinograph leads some to think of superior subluxation on one side or inferior on other. This variable must be guarded against.

There is a common constant for transverse processes of atlas.

Variables of transverse processes of atlas:

—one side may be long, other short

—one side may be thick from above downward, other thin same way

—one side may be thick from before backward, other just opposite

—one may be fractured with displacement and distortion of position of segment, other may be normal

—some may have combinations of any or all and give a combination effect, etc.

These osseous protuberances are important because each is a landmark for adjustment as well as an auxiliary guide in determining subluxation on side-wedge. Variables must be determined and read out so constant can be read in, otherwise conclusions might be unsound and incorrect.

ODONTOID PROCESS VARIABLES

Odontoid process must be set apart from the articulating surface on odontoid when referring to this portion of axis:

- some odontoid processes are fractured at base.
- some never unite to atlas above or connect with base below—others are comminuted fractures in various directions and heal splintered; others are split in two sections cross-wise from above downward, presenting two articular surfaces, one on each segment.
- some have a horizontal fracture of superior portion from lower half, transverse ligament holding lower half solid and permitting upper half to be fractured.
- some processes have been softened by heat of osteomalacia and flattened in many various possible directions. This variable could and often would distort position thereby perverting spinograph into wrong interpretation of position. To adjust atlas and require that it permanently assume normal position on odontoid process requires time for Innate to rebuild new facet. This explains time element in some cases.
- some present exostoses at various places on body proper of process, outside of what might be on the articular surface.
- some processes are eaten away by caries, necrosis, tuberculosis, osseous sarcoma, syphilis, healing over the stump so that individual has no odontoid process.

This complicates reading of spinographs and complexes adjustment.

- some present true exostosis on outer lateral rims; others on extreme superior rim; others on inferior base.
- some present false exostosis anywhere around edges of articular surface formed of material squeezed out by softening.
- some exostoses, true or false, form an osseous lock, either on side, above, or below, and limit motion by subluxation and thereby restrict action in adjustment and thereby complicate interpretation of spinographs.
- some are tall and slender, others short and stubby. In a spinograph, you would need decipher whether anterior arch of atlas corresponded or didn't.
- some have an articular facet high, others low, on the tall and slender process. This is a variable that would fool interpretation placed on spinographs. It should be looked for at center of a normal process. It would change reading from superior to inferior or vice versa.
- some have extensional exostotic growths beyond the tip of process, extending superior articular facet placing it higher than normal. This may be adaptive to a superior subluxation of atlas or it may be an elongated facet and permit atlas to ride up and down its full length.

The articular surface on posterior surface of anterior arch of atlas:

- some are flat laterally, or superior-inferior; others concave; others very much concave; some even convex.
- some are bisected cross-wise, others are bisected perpendicularly into two surfaces.
- some are bisected with a flat surface above and a concave surface on lower portion; sometimes one is convex—this complicates movement of head, gives something different to read in a spinograph, and forces one to think how to adjust.
- some slope obliquely posterior from above downward, others slope obliquely anterior from above downward.
- some are concave from above downward; others concave from side to side.
- some are very broad on articular surface, others slender and come to a ridge in center.
- some dish in; others out.
- some have been flattened by osteomalacia in various irregular and unexpected surprising directions causing head to adapt a side facing which cannot be avoided by case.
- some are highly polished by attrition between the two articular surfaces between odontoid and atlas.
- some present various combinations of osseous locks, on one side or other, top or bottom; some one place, some another, making adjustment of atlas slow and deliberate until osseous lock is broken down and carried away by osseous dissolution by Innate.

- sometimes a new facet is builded on top of old facet beneath, formed of new osseous material (true exostosis) pilastered on top of old facet. This may push atlas anterior away from odontoid, producing an exostotic atlas subluxation just as vital as a mechanistic one. Stereoscopic spinographic films will reveal this when it exists. It in no way changes adjustment except for time in reconstruction.
- in some we find odontoid ankylosed to articular surface of atlas as a result of fracture of odontoid.
- in isolated cases, odontoid is found fused to articular surface of atlas. In such case, rarely is atlas fused to occiput.
- some articular surfaces on posterior of anterior arch of atlas, including sometimes the arch, are eaten away by caries, necrosis, tuberculosis, osseous sarcoma, syphilis, etc. This seriously affects motion of head and is attendant with great pain in that area. All this can be seen in spinographs, especially in stereos, if recognized when it appears.

The anatomical constant quoted, amidst possible anomalous, pathological and/or traumatic variables given, is true regardless of what abnormalities present themselves. This constant, amidst variables is true, regardless of what articular surface on atlas presents, the articular surface on odontoid process is like it except in reverse direction corresponding in like characteristics and off-sets it in like kind. In reading any spinograph of atlas-odontoid articulation with possible variables, it is a constant to remember that what is on one is on other. With that constant kept

in mind, variables will not confuse and will explain why some adjustments are easy and quick in results and others are seemingly hard and slow in staying put.

TRANSVERSE LIGAMENT VARIABLES

No study of these articulations would be complete without attention to transverse ligament which, as a constant, holds odontoid process in articulating hub-like ring against anterior arch of atlas, prevents it from slipping out of its sphere of action, etc.

- some are torn loose at either or both ends, and seemingly dangle loose.
- many are green-stick fractures which permit great stretching by elongation and extension of normal length into abnormal length permitting odontoid process to lose perfect contact.
- some are fractured into segments, same as any bone will do. Being of semi-soft structure, it is sometimes difficult to see these variables in spinographic pictures taken to reveal bone shadows. If suspected a soft-tissue picture is advisable. All cartilaginous fractures are healed and mended by osseous tissue structure, therefore it is possible to find transverse ligament sometimes formed into bone substance producing bone shadows in spinograph.

This is an anatomical constant. Those conditions, outside of green-stick fractures, happen occasionally, and would not happen frequently in an ordinary and usual case. Unless there is history of accident, it might not be suspected.

ATLANTAL-AXIAL VARIABLES

Articulations between inferior of atlas and superior of axis again change the study. It is upon these articulations, rotations of occiput and atlas revolve around axis odontoid process on superior articulations of axis. Some of the anomalous, pathological and/or traumatic variables are:

- some are level, some backward, and side to side.
- some dish in with facet at root much lower than outer rim.
- some dish out with facet at rim much lower than at root.
- some are round, others oblong before backward; some triangular with point external.
- some are concave as tho sunk inward by collapse; others convex as tho bulged upward.
- some are bisected (and this is not uncommon) midway between before-backward with frequently a marked depression between.
- some are bisected, with one-half depressed, other half bulged upward, acting as a mechanical lock on atlas.
- some have been flattened by osteomalacia and flattened in various possible directions.
- some present true exostosis on outer lateral rims, sometimes flattened out, sometimes elevated.
- some present false exostosis on outer rims formed of material squeezed out by softening.

- some exostoses, true or false, form an osseous lock and limit motion of subluxation and thereby restrict action in adjustment and thereby lengthen time to correct until such as been chemically dissolved by Innate.
- occasionally there is ankylosis of occiput, atlas, and axis as one unit, but this is extremely rare. I have known of but two or three cases.
- more common is the fusion of occiput, atlas, and axis prenatally. This too is rare.
- some articular facets are highly polished by attrition by friction between axis and atlas, there being no bursa between, bringing bone contact to bone. This brings the two bones closer together from above downward and should be understood to be correctly read into spinograph.
- sometimes an entirely new facet, on one side or both, over old one, or sometimes in a new location, is formed of new osseous material (true exostosis) pilastered on top of old facet. This may elevate atlas on that side or seemingly lower it on other, according to which side it may be a Hi or Lo, giving false conclusion in reading a spinograph.
- some are eaten away on one side or both, by caries, necrosis, tuberculosis, osseous sarcoma, syphilis, etc. Shadows will reveal if such exists in spinograph if care is taken to recognize shadows when they do appear. Truly it can be said: "To know constants in anatomy and variables in anomalies, pathologies and traumatisms is to know spinographs."

The anatomical constant quoted, amidst possible anomalous, pathological and/or traumatic variables given is true, regardless of what abnormalities present themselves. This constant, amidst variables is true whatever the articular surface on axis presents, articular surface on atlas is like it except in reverse direction corresponding in like characteristics and thus offsets it in like kind. In reading any spinograph involving atlas-axis articulations with their possible variables, it is a constant to remember that what is on one is on the other. With that constant kept in mind, variables will not confuse and they will explain why some adjustments are easy and quick in results and others are seemingly hard and slow in staying put.

With millions of people and millions of bones, there are no two alike, yet all are built on same plan and have everything in common constant. With all occiputs, atlases, and axes in living people, no two are alike, yet have a common constant the variables of which can be duplicated in some specimen in this osteological studio. **To know osseous specimens is to know living persons with similar variables.** People are a constant with sufficient variable to make no two alike. Same is true of bones, including occiput, atlas, and axis. There is a constant, with variables. They are variables, with a constant.

No person can approach this osteological laboratory, look or glance at its specimens, pass from one cabinet to another, spend possibly a day or two glancing them over, and comprehend the magnitude of gaining knowledge sufficient to bring forth service to be gained from them. These specimens required 30 years to gather, 30 years to study, 30 years to know. Each specimen is worthy of entire time

average individual spends in laboratory. To study osteological specimens is like going to a museum or art studio. Many people pass thru in an hour, others stay a morning; others spend years and never gather all they desire to know of museum pieces placed on exhibit.

Vertebral subluxations, especially of occiput, atlas, and axis, present more complex articulations than any other in body. It is harder to explain, to write, to study, to understand. Each patient has a subluxation based on the anatomical constant it was and the subluxation variable it is. Without knowing his constant, there can be no knowing his variables. To correct his variables, we study his spinograph seeing in them what his constant was that his variables may be corrected back to his constant. There is where knowledge of osteological specimens increases a Chiropractor's value one thousand fold.

If atlas is subluxated Right, it must be adjusted to Left. Whether atlas is Right, is a question of interpretation of spinographs. To interpret correctly, depends upon breadth, depth, and length of knowledge of normal and abnormal osteology; the constant and variables. We lay down rules, which are followed, and fit in majority of cases. Plane lines are drawn. They depict a R. wedge. Adjustments are given. This solution of correct adjustment works in majority of cases. Now and then you fail. You cannot apply rule of constants to a case that requires rule of variables. What is the variable in this "incurable" case? One must know variables or he can't apply them; to apply a wrong one is as bad as to apply none. The purpose of spinographs is to present the vertebrae for study to see what is or is not present, either anatomical-constant-vari-

able or which of the many anomalous, pathological, and/or traumatic variables are present. Application of the right variable to "problem" case is to make correct analysis, after which you again step up another minority percentage of "incurables." Here is one of minority cases where anomalous, pathological, and/or traumatic variables should be known, applied, and remembered, located in spinographs, given correct interpretation and adjustment based thereon. Average Chiropractor applies rules of constants to cases which have anomalous, pathological, and/or traumatic variables. He blames Chiropractic, himself, wrong adjustment, wrong system or method, spinographs, NCM, etc., and searches for foreign substitutes. That same case could come to The B. J. Palmer Chiropractic Clinic, we will use everything Chiropractic he used, except we will interpret into spinographs our knowledge of anomalous, pathological and/or traumatic variables, change analysis, give adjustment, and get case well.

ANOTHER REASON WHY

Reading an occipito-atlantal-axial set of spinographs is more than looking for a subluxated position of one vertebra, to ascertain its present subluxated position, and figuring direction it should be adjusted to get case well. There is the anatomical constant normal position, where it was but is not now. In addition to subluxated position of one vertebra to be seen, we look for and ascertain by negation any of hundreds of possible anomalous, and/or pathological, and/or traumatic variables and how any or some of them being present and affect and modify interpretation of position of subluxation otherwise that to be seen. Many modify

the conclusion and shift position to R. or L. It is these elements which create "impossible" and "problem" cases which we get in The B. J. Palmer Chiropractic Clinic; which we seek and frequently find, which makes our interpretations different, which soon shows in getting case well where others who follow simple routine fail. To think only anatomical constant as was and should be and thus ignore multitudinous anomalous, pathological, and/or traumatic variants that modify usual technique of reading spinographs, is to not see some of the most salient issues of study. Fortunately, majority of cases do not fit into these categories. Unfortunately, minority of "incurable" cases do fit into these categories. The B. J. Palmer Chiropractic Clinic does have the Osteological Laboratory which makes such comparisons vital to recovery of "stubborn" cases. Ordinarily, a matched set of occiput, atlas, and axis before Chiropractor in spinographic reading room makes it possible to compare the real with spinographs of duplicate parts in his case. Extraordinarily, thousands of specimens of sets of occiputs, atlases, and axes are before us in our Osteological Laboratory where we make comparisons between actual variables to compare with spinographs of duplicate parts found in "unusual" cases.

What you look at in a spinograph may be exactly what you see, but are you seeing exactly what you look at in a spinograph? This is not paradoxical. You look in a spinograph and see what appears to be what you define it to be as to subluxated position comparative to vertebra above and below. Is it what you define? If an anomaly exists on one side, not on other; if pathology exists on prezygapophyses and not on postzygapophyses; if traumatic crushed

healed fracture cicatrix exists on odontoid (cited as some of many possibilities) then what you look at in a spinograph may be exactly what you see, but you are not seeing exactly what you look at. These are actualities occurring more or less in many people which cannot be told by instruction (except in a general way), cannot be put into type (except as examples such as we have listed here), neither can they be written into books (which we have not attempted). This education comes after hundreds of intimate hours with eighteen thousand specimens, studying possibilities in comparative sets of what could happen if this or that was present and how it would modify what you thought you saw if a spinograph were taken at this or that angle, etc.

The broader the understanding of constant and knowledge of variables in osteological specimens, the more one can read in spinographs of living individual from whom spinographic pictures have been taken. Person who looks at a spinograph and sees little in it is one who would look at any osteological specimen and see little in it. Other person who has spent years looking at thousands of osteological specimens can take a spinograph set and see in it a reflection of his understanding of anomalous, pathological and/or traumatic specimens he has studied for years.

CONSTANT OF NCM READINGS

The Chiropractor has the thot, intent, purpose, and desire of accuracy in NCM readings. By so doing, he establishes efficiency, accuracy, competency, and honesty of accomplishment. He and his NCM are in good working order. He bends over case, glides slowly, carefully, and concentratedly. With this advance preparation, during the act

itself he thotlessly permits people to weave about him, moving their hands, skirts, feet, trying to observe what he does and how. Others call, speak; he answers, and starts over again. Movable shadows play patterns on the floor within the range of his vision. Variables? He permits a score of them to divide, dilute his mind, misplace its concentrations. Everything else is perfect, but **variables** of distracted sight, sound, thot, keep him from reaching his objective.

NCM readings are of value if correctly made, accurately interpreted. This cannot occur except as the constant is in use. Another Chiropractor bends over his case, carefully, thotfully. He permits no person to move within range of his vision; shadows are absent; no voice is heard; his mind is **completely** on the one thing he does now—that reading. Nothing to distract the eye, ear, or mind. His reading is efficient, accurate, competent. He **knows** the reading. This man has and uses a constant.

DOES HOUR OF DAY MAKE A DIFFERENCE IN READINGS?

Man is taller in morning than at night. This is brot about by continued relaxation at night, separating vertebrae. Man is shorter in evening than in morning. This is brot about by gravity weight compressing vertebrae closer together, the longer that gravity weight is on during the day.

Reading taken in morning show a lesser number of places and readings less high on an average. Readings taken at night will show one or two more on an average.

Majority of such readings are slightly higher, varying according to degree of chronic subluxation.

Readings will be slightly higher towards noon, after morning's labor with a laboring man. After noon lunch and hour's rest, sitting or lying, readings will be slightly less.

So long as man is man, as man labors, as man contracts and relaxes, as man labors and rests and thus fluctuates with varying periods of his day, I know of no way avoiding it as a fixed variable to be dealt with in our NCM readings.

In research checks on cases where no adjustments were given, there is an approximate constant in number of places and degree of readings, major always remaining as a constant with difference that it is less after a period of relaxation than when working or under gravity compression, and gradually increases slightly towards evening.

Example: Laboring man.

7:00 A. M., reading as follows:	Same case at 7:00 P. M.
Axis 2L	Axis 2L
5C 3R	5C 3R
5D 3L	5D 4R
10D 4L	10D 5L
3L 5R	1L 3R
	3L 7R
Total 17.	Total 24.

In this case, one more reading was observed. Checking many cases, it was observed that greater increase in places and totalities was usually confined to dorsal and lumbar regions; few additions and increases noticed in cervical regions. No case under such conditions showed any reading

out, nor were any readings reduced in evening, by comparison. Labor, strain, and compression increased invariably.

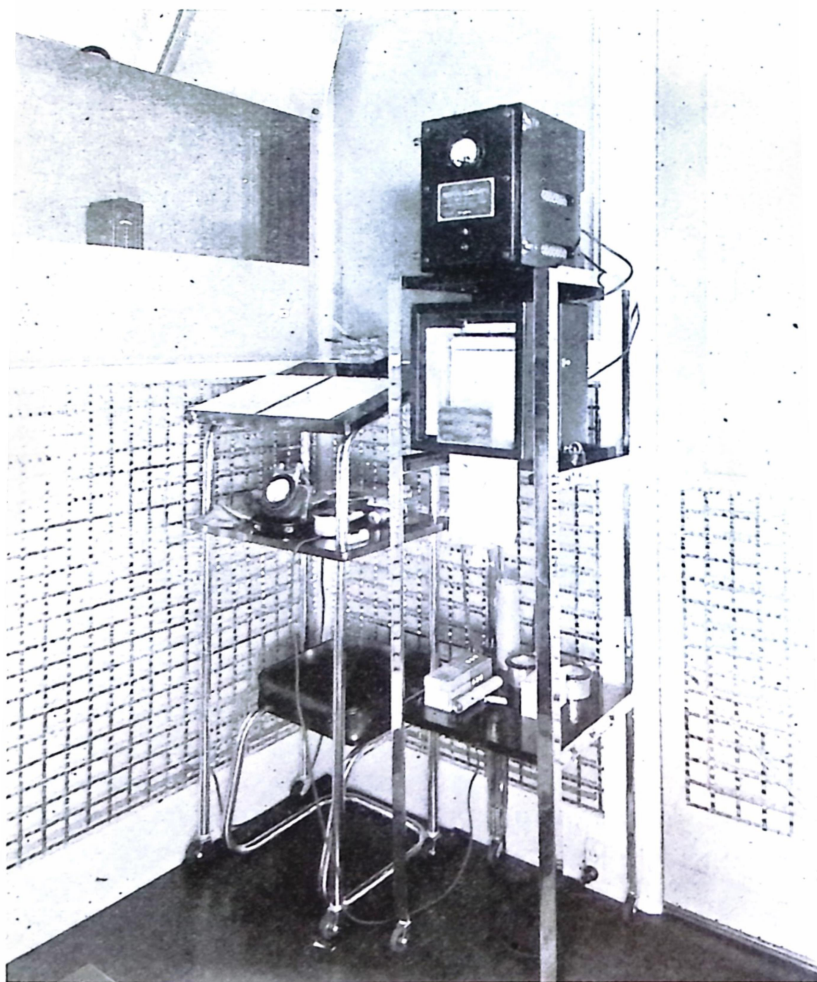
For this reason, The B. J. Palmer Chiropractic Clinic has an established constant of reading and adjusting cases in its Clinic between 1:00 and 2:00 P. M. We have established hour constant on all records thruout Clinic, that we might establish information based on hour made. Every printed record form cites hour constant. Time is a constant in our Clinic by a distribution of 35 electric Telechron clocks. Every department, office, or laboratory of Clinic is of same hour, minute, and second. What a satisfaction to make an appointment by one clock and have patient keep it by another—all activities regulated by same common constant of 24 hours, 60 minutes, 60 seconds, no two clocks being at variables with each other. If each clock had a time of its own, and every clock was at odds with every other clock, that would be a series of variables that would play havoc with all Clinic laboratory work. (Bearing on this question, I ask the reader to review Pages 121-126, and "Science Duplicates Itself," Pages 134-145 in *The Subluxation Specific—The Adjustment Specific*, Vol. 18, Palmer.)

If Chiropractor has variables in X-ray technique, NCM technique, it follows that he will have them in adjusting technique. As a result, he builds more variables, the farther he goes. Getting no results from use of variables, he keeps on multiplying them. No wonder his mind is a maze, bewildered, and does not know which way to turn. In this respect, he would be no different than a mathematician, astronomer, or chemist who was endeavoring to build constants out of variables galore.

For these reasons, we advise you have each case appear at a regular hour of day, that you check under like conditions, protecting your record in readings established as a basis of study for welfare of case. If this human equation could be ignored or was of no vital value, case could be taken at any time convenient to him. Notwithstanding readings would be more numerous and of higher degrees in evening, it is inadvisable to take case in morning of one day and in evening of next, for your basic constant for calculation would vary so greatly you would have no fair equitable basis for understanding progress of case.

Under adjustment same rule applies, but with varying degree of variables that follow adjustment. Evening readings are more numerous than morning; they are usually higher, but gradually as morning readings are eliminated, so are they proportionately reduced in evening; as number of readings reduce in morning, so do they at night; eventually to get all gone in morning, so do they fade out in evening.

If your case comes regularly at 8:00 A. M. daily, he will arrive under a like condition day after day. Any observation made one day will tally fairly constant with that of every other day. On reverse, if you have a case at 8:00 A. M. Monday, and at 8:00 P. M. Tuesday, comparative readings would be different—at its best on Monday, at its worst on Tuesday—other things being equal; and constant established Monday would not be fair to that of Tuesday, or vice versa. To be fair to cases, I have them appear at 1:00 P. M. Any other hour of day would be equally as fair, if so established. It is better to have cases come at a regular hour each day, every day. (Copied from pages



The neurocalograph as set up and in use in the shielded and grounded NCM reading booth of The J. B. Palmer Chiropractic Clinic.

107-108, **Crowding the Hour**, issued at Lyceum, 1932). (We suggest the reader review "Is There an Ebb and Tide to Subluxation Frequency," page 62, and "When Is a Subluxation?," page 83, of **Disciplining the Hour**, printed Lyceum, 1933, issued by The P. S. C.)

THE NEUROCALOGRAPH

Proper title for this instrument should be "Neurocalometergraph"; to not only measure (meter) but record (graph) nerve heat.

The ultimate objective of The B. J. Palmer Chiropractic Clinic is to eliminate **every** variable and thus attain the constant on every possible phase of our Clinic research work.

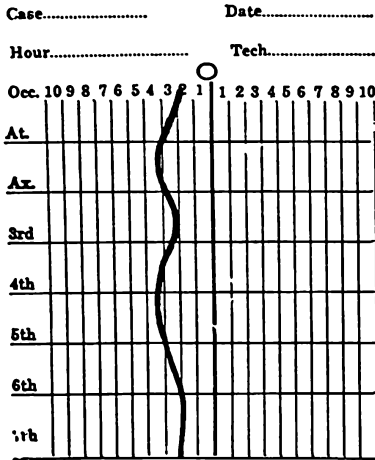
We now have seven true terms to express two important branches of the chiropractic principle and practice.

Spinograph—an X-ray radiograph as confined to the spinal column for the purpose of ascertaining precise, accurate and true conditions of a vertebral subluxation, both before and after adjustment.

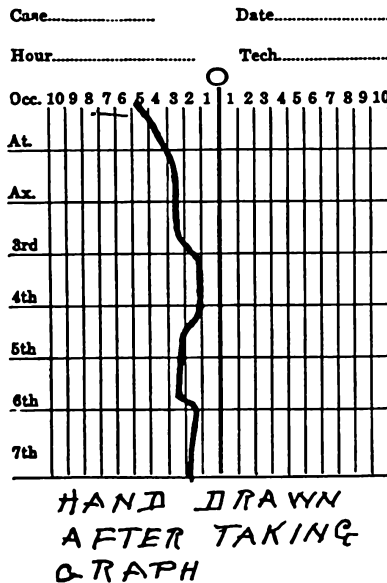
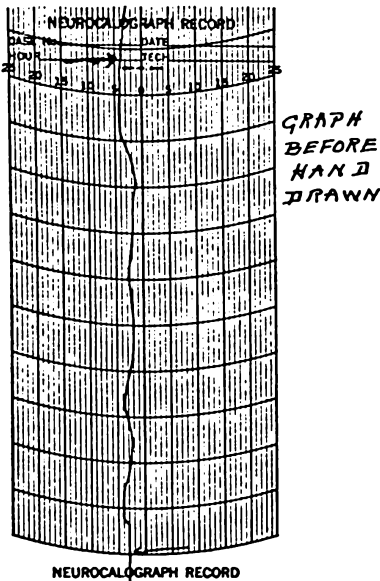
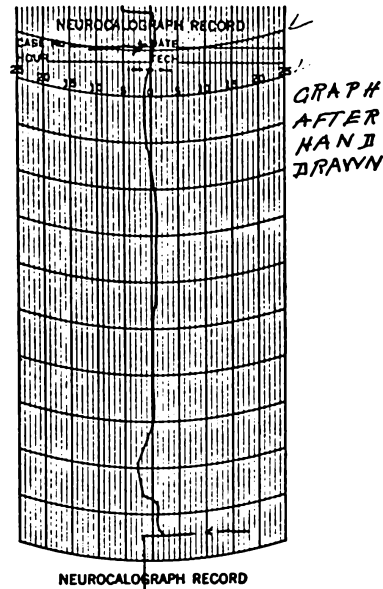
Spinography—the science which teaches how to posture, expose, develop and interpret accurate and true conditions of a vertebral subluxation, both before, during and after adjustment.

Spinographer—one who understands and practices the art of posturing, exposing, developing and interpreting accurate and true conditions of a vertebral subluxation of the spinal column, both before and after adjustment.

Neurocalometer—a scientific instrument of precision builded of a thermo-couple and galvanometer placed astride



HAND DRAWN.
BEFORE TAKING
GRAPH.



To test efficiency and accuracy by comparison, between man made graph and neurocalograph, we took two sets, two ways. In upper two, the hand graph was made before the neurocalograph, same person. In lower two, neurocalograph was made first followed by hand made graph, same person, but different person than upper two. Study shows major discrepancy in lower two readings. Hand made would have been called a 2 point break reading. Neurocalograph said "No."

the living spinal column to locate minute degrees of temperature induced by interference of transmission of mental impulse supply between brain and body because of vertebral subluxation. It is used both before and after adjustment as a time and locator factor before and a check method after an adjustment.

Neurocalometry—the science which teaches how to accurately, efficiently and competently use and interpret the findings of the neurocalometer.

Neurocalograph—a hook-up system of an neurocalometer, potentiometer, and recording device which permanently graphs the accurate records and findings of the neurocalometer as used astride the living spinal column to locate minute degrees of temperature induced by interference to transmission of mental impulse supply between brain and body because of vertebral subluxation. It is used both before and after adjustment at a time and locator factor before and a check method after an adjustment.

Neurocalographer—one who understands and practices the art of using and interpreting true and accurate readings made by the neurocalograph.

Neurocalometer is an instrument to read nerve-heat. It is self-contained in that thermocouples are in same hand-held instrument which contains galvanometer. Hand holds and glides instrument astride spinal column; eye looks down upon and sees deflections of needle to left and right of a median "0," thus observing degrees (of heat) read on left and right of median line of spinal column.

In the past, one serious problem has been faulty technique of NCM technician. Either he was too fast or

too slow in gliding over area being read; looked but did not see what he was looking at, permitting external variables to side-track vision. His mind wandered, thinking other things when it should have been 100% concentrated upon what the needle was trying to tell; or he could not carry all in memory exactly as he was supposed to fully understand. His hand was unable to direct pencil to accurately record on paper memorized deflections of needle, etc. All these are now an automatic mechanical constant. The only external variable left is accuracy with which Chiropractor holds NCM in his hand in gliding process. It would seem as though he ought to be able to do one thing right if all the rest are done automatically by mechanical means.

Ten people "see" an accident which happened one way with one sequence of events. Yet ten people will report ten ways and ten sequences of events. What happened was single; yet it is multiplied. Different eye values, mental concentrations, time lags, intellectual understandings, etc. NCM is glided up one neck with one result. Five people look and "see" five interpretations of what needle revealed. Five pairs of eyes roamed in varying degrees; five minds thinking five avenues of contrary thoughts. One thing occurred, yet five interpretations exist. No wonder I properly say Chiropractic is scientific, but Chiropractors have not yet had means to prove it. I exhort classes in NCM technique to physically prevent and to visually obviate surrounding moving bodies to prevent detraction of sight concentration, to prevent noises which detract hearing concentration. In spite of exhortations they unthinkingly permit it so they produce a detracting interference to improved work. Many shortcomings of Chiropractors are attributed to impractical use of NCM

in HIO work because of inability to perfectly mentally fix what needle perfectly delivers. That and those weak links can be eliminated by using neurocalograph. Moving objects and noise do not bother it or its record.

Human variables have entered and seriously interfered with average Chiropractor's efficiency. Hand often glides slow or fast. Hand cannot glide too slowly. To glide slowly is to correctly record **every** variation in mean-line of heat as well as to correctly record every distinct "break" from that mean-line. To glide rapidly is to incorrectly record broad sweeps of mean-lines and incorrectly record a "break" as a portion of a broad mean-line heat reading. We seek correct information of "breaks" from mean-lines. To glide rapidly is to incorrectly glide them out of visualization so eye cannot see them. Neurocalograph checks on speed as well as acts as a check-up on speed. If gliding is too rapid it will record on too little paper; if too slow, it will take too much paper and run over allowed space. The neurocalograph is constructed to travel 6 inches in 30 seconds, enough time and space to correctly read the cervical region, for it takes approximately 30 seconds to read **slowly** from 7th cervical up to and including base of occiput. Human variable of speed is checked by automatic constant speed of recorder.

The human eye will see no more or less than eye concentrates upon what eye looks at without external interferences. Moving objects, to left or right, front or rear, of person reading, will interfere with eye seeing **all** it should of deflections of galvanometer needle. No eye, no matter how well trained, can see **every** minute deflection. Neurocalograph recorder secures and fixes **every** deflection, no matter how large or small; how rapid or

slow. Diversions of human eye, as external variables, are now eliminated from record established.

The human hand, with pencil and paper, in past, has attempted to record what mind directs, which eye sees. Often the hand does not reproduce as exactly mind thinks or tries to remember. As eye does not see all, mind does not think all, or memory remember all, so does hand not reproduce all. Neurocalograph recorder has no hand to be directed by faulty muscles, as directed by lagging mind, as seen by tricky eye. It records in automatic mechanical action exactly what current reaches and directs it. It jumps direct (theoretically) from physics thermo-couple heat generation to mechanical recording graph, omitting doubtful intermediary eye, mind, memory, hand variable. It jumps human frailties and establishes mechanical precision.

Six time-lag variable leakages enter between what thermo-couples actually, accurately, and scientifically deliver, and what record paper actually inaccurately and Chiropractors as human beings don't deliver in their hand-drawn graph. They are:

1. Eye does not see all NCM needle describes.
2. Eye does not brain-record all it sees.
3. Brain does not fully interpret all it receives.
4. Mind does not remember all it interprets.
5. Memory does not transmit to arm muscles all it remembers.
6. Arm muscles cannot correctly graph-draw all they receive.

Authors of three books from which we quote in Addenda 25, 26, and 27 are foremost authorities on light, mental reception, mental concentrated or diluted interpretations, plus or minus physical action and reaction, and speed each takes from time of recording impression in eyes or ears, to action in mental interpretation and physical action and reaction.

As Chiropractors, we are concerned with external detracting and distracting influence in prohibiting mental concentration. Quotations from these books apply directly or indirectly to our problem of eye seeing dial of NCM, eye also seeing external variables which detract; ear hearing noises, both distracting mind of observer and hearer from concentrating 100% on what he is looking at and cannot see because of external interferences which "block" internal mental concentration.

Chiropractors know we have frequently raised this question. Chiropractors also know they have frequently raised their question that NCM "is of no value" because they look, don't see, don't adjust when they should, or do "adjust" when and where they should not, upsetting facts obvious to some of us who look and do see. Fault lies in their inability to concentrate. They permit extraneous variables to exist in their offices and thereby intercept their eye from seeing because of moving objects and noisy conditions which cars pick up which dilute mental understanding.

Neurocalograph, besides creating an automatic exact record, obviates this problem of extraneous variables to sight and hearing making what will be a perfect record. All Chiropractors are not so favorably situated that they can have a neurocalograph as part of their office equipment.

In that event, these addenda quotations will help them to better understand their mental problem.

If an office be equipped with neurocalograph, where human detractions and distractions could exist, it is better that they be assiduously kept out as though that office were not so equipped. So long as human element, Chiropractor or patient, exists, detractions and distractions must be eliminated. So long as human hand of Chiropractor must direct pressure, locations, etc., of NCM, it behooves him to permit no foreign variable to change from being as perfect as is humanly possible. However, where neurocalograph makes actual automatic record, that part of human equation, cannot be detracted or distracted from its mechanical perfection of actually recording what electrical current is generated in thermo-couples.

Purpose of introducing this subject, with attendant Addenda 25, 26, and 27, is to again emphasize importance of visual concentration and eliminating external visual variables in sight and hearing which by elimination increase value of what eye sees when it looks. (See Addenda 25, 26, and 27.)

Neurocalograph eliminates external variables of eye, mind, memory, and hand in reproducing drawing, but not in use in gliding. It records accurately, efficiently, competently, and exactly as needle is deflected based on current generated as established by heat thru thermocouples, via an automatic mechanical set-up which has no eye, mind, memory, or muscles subject to external variables.

Use of neurocalograph prevents pick-ups and start-over-again readings. Graph record, if it consisted of starts and stops, would be a jumble of offs-and-ons, heres-and-

theres, and be unintelligible to read with accuracy, competency, or efficiency. To stop and start again with record of neurocalograph is to have a series of breaks, broken continuity and thus it loses value of one continuous graph, especially in location of broken sections of reading. If graph based on pick-ups and starts-over-again would be jumbled and unintelligible to read, what about the eye, mind, memory, and hand which would try to see, observe, think, and remember a serious of start-and-stop readings. Neurocalograph forces us to teach and train ourselves to make one single complete reading from beginning to end.

MECHANICS OF NEUROCALOGRAPH

Unit No. 1, specially designed NCM balanced thermo-couple circuit. It hooks direct into

Unit No. 2 an automatic electronic potentiometer which is photo-electrically operated in a special bridge circuit. The instrument provides a highly sensitive means of indicating or recording voltage or current at ranges as low as two millivolts or five microamperes full scale, or even lower if required. Temperature or other physical quantities convertible to electrical terms may be indicated, recorded, or controlled with a speed and precision hitherto unattainable in dealing with the minute electrical input encountered in many such applications. The instrument furnishes an indicating current capable of operating meters, recorders, control relays, etc., which can be placed at any distance from the potentiometer proper. The instrument contains no moving parts with the exception of the galvanometer itself, which has no control torque and is free of zero drift. Deflection of this mirror galvanometer causes

a beam of light to differentially illuminate a pair of photo-electric cells or tubes. These tubes are in a bridge circuit connected to the grid and cathode of a vacuum tube, so arranged that the changing light "Differential" between the photo-electric cells results in a change of grid voltage. This change in grid voltage, in turn, electronically re-adjusts the indicating current to balance the circuit across a standard resistor. The circuit will hold itself constantly in balance, and immediately readjust itself for any change of input value. Balance involving a full scale change in indicator deflection takes place in a fraction of a second. This system of balancing is independent of elements other than the value of the standard resistor and the meter giving the final readings. Changes in supply voltage, vacuum tube characteristics, photo-cell efficiency, light source intensity, etc., lie outside the critical circuit and therefore do not affect the device as variables. This unit works directly in conjunction with

Unit No. 3—A highly sensitive recording milliammeter equipped with Weston D'Arsonval movement, 110 volt, 60 cycle telechron clock for moving the 6" strip chart NCM, 7th cervical to occiput HIO reading, at the rate of six inches per minute with pen making a continuous ink record on chart. Length of chart roll, 90 feet.

This combination gives instantaneous readings of changes in the NCM electrical input currents, and automatically records a NCM-HIO graph on a chart of any left and right deflections and degrees thereof, as took place in Unit No. 1. To have a competent record, an accurate graph with precision in heat reading in the neck with the NCM at one end, to be properly balanced with automatic graph record at the other end, calls for the

most exacting and specially-built equipment we have and use in The B. J. Palmer Chiropractic Clinic. Equipment cost \$1500.00 installed in our Clinic. Altho the last word in precision scientific attainment in Chiropractic graph recording, the price will undoubtedly limit its use in Chiropractors' offices.

FACING THE GRAPH PROBLEM

Sometime, some place in this book one question must be faced and discussed and perhaps this is as good as any. What is a Chiropractor to do who cannot afford to equip his offices with precision X-ray equipment, shielded NCM booth, X-ray comparative graph outfit, neurocalograph, etc.?

The ambition and objective of **every** Chiropractor should be no less his objective than it was ours, viz., to so equip his office with every and all kinds of necessary apparatus which accurately and completely enables him to do those vital things which lead him to positive evidence, data, and information of **what** to do, **where** to do it, **when** to do it, and **how** to do it, which more efficiently aids more perfect correction of causative subluxation in a greater percentage and thus an earlier recovery of his cases. If, temporarily, he finds himself stymied, unable to so equip his offices, he should remember that his problem is **now** no less our problem yesterday when we labored with equipment which was best we had until we could do better, as he labors now with equipment which is best he has until he can do better.

My father started in 1895 with none of the things we today deem necessary and essential. He did not have an

X-ray; he depended upon palpating fingers. He did not have an NCM to pick minute heat readings; he sensed gross heat with backs of hands. He had no shielded booths, always sleeping with his head to North, acknowledging principle of interference to variable energy flows. He had no comparative osteological graph, but he did know osteology from studying thousands of osteological specimens. Neither did he have a neurocalograph, but he fingered tender nerves, digging in their backs both before and after adjustments. He did not have the best we have now, but he used extensively, and highly developed next best which he did have.

Suppose he had become discouraged, decided to quit, because many questions raised could not be answered. Suppose he had called it a day because there were problems which he could not answer for want of proper equipment which had not yet seen light of day. He did live on hoping some day they would be. Suppose he had gone hay-wire because he did not have and could not secure inside, minute, and detailed information he badly wanted—and died without ever having understood—which we today have. If he had quit thinking, studying, investigating because he wanted then what we have now, then we now would not be where we are.

For years I struggled without X-ray, using palpating fingers. Then came the time when I realized my fingers were not palpating all I was entitled to know. I secured an X-ray. Then I struggled along developing its technique subsequently revealing what I needed to know. Now it is yours for the getting. After it revealed what I wanted and needed to know, I struggled to get our profession to see what I saw it revealed. For years I struggled without an

NCM, using backs of my hands. Then came the time when I realized my hands were not revealing all I was entitled to know. I secured an NCM. Then I struggled developing its technique subsequently revealing what I needed to know. Now it is yours for the getting. After it revealed what I needed to know, I struggled to get our profession to see what I saw it revealed. So it has been with every step. It is but another step to another step. Each new step makes us see necessity for more accurate and precise future information beyond our past horizon. We see a problem, we struggle for solution. We struggle without information until we get it. Then we struggle to another problem that solution of last problem presents.

You say these items you now need cost money. True! But you get them as a finished product. We took years to work them out. Where they cost you one dollar, they cost us thousands. Where you worry about how to get it, we worried about how to solve it. Where you worry about how to use it, we had to worry thru the problem, development of instrument and technique, and then teach it to you. Where it came hard to us then, it comes easy to you now. You suggest that you have been in practice eight years and have (or have not) kept up with the growing procession of our movement. I suggest with justice that I have been in practice from day the baby "Chiropractic" was named, have nursed him thru to present manhood, and I have not kept up with its growing demands. For forty-one years I was laying ground-work, building foundation. Now I build the Clinic that has been my consistent ambition. Forty-one years I have waited to secure things I now work with.

Our ultimate objective is always before us. So is yours. Our problems were more beyond us than they are beyond

you. We have solved some of ours. We present them to you without any of the struggle financially and professionally which we had, to produce their solutions. All you need do is to reach out and take them, they being yours for the taking.

Not every swimmer is the fastest; not every sprinter is in the lead; not every automobile is the first; not every train is the finest; not every aeroplane is the speediest; not every machine shop is the best, neither is every newspaper the world's greatest. All at the top have hurdled every hazard. All those behind or below "tops" have hurdled some of, but not all of the mental hazards.

You will go on as we have always gone on, doing the best you can with what you have to do with. You will hurdle as many hazards as you can. You will keep on striving to hurdle the rest—those ahead that are higher than any you have succeeded in jumping. Each hurdle you jump makes next higher jump easier to overcome. You have been getting a certain percentage of sick cases well—those that come within your mental hazard grasp; those hurdles you can and have jumped. D. D. Palmer did it with Harvey Lillard in 1895. We have been doing same with cases we had, with what we had to do it with, since 1895. As he struggled to jump higher hurdles ahead, as we struggled to jump higher hurdles ahead, so will you. As we struggled, and succeeded in part, so will you.

When you reach an *impasse* with a problem case and find your equipment incapable of delivering information you so much need and wish you had, send that case to us and we, with our more complete, precise, and accurate equipment, will solve that problem and refer him back to

you for further service until he gets well. With this aid on our part, we serve you again, and thus help you succeed where you would otherwise fail until such time as you can secure equipment you need and thus obviate a repetition of that failure on next like case that comes to you.

The B. J. Palmer Chiropractic Clinic, with its elaborate, precise, and exacting equipment is at the disposal of any case of any Chiropractor at all times. We builded this Clinic and conceived and builded our equipment for that purpose. It is the least we can do to help the Chiropractic profession over those hazardous hurdles beyond, until he can jump them himself.

CONSTANTS IN ADJUSTING SUBLUXATIONS

There are variables and constants in adjusting vertebral subluxations.

Case No. 73 entered The B. J. Palmer Chiropractic Clinic January 8, 1936. First he went to a home-town Chiropractor. He "adjusted" first on left side of atlas, then turned head over and "adjusted" right side of atlas, same day. He continued this 21 days. Result? Case was better and worse, worse and better, never getting well. Case went to another city, another state, heard of good reputation of HIO man. X-rayed carefully and correctly. Found subluxation to be Atlas Right. Second Chiropractor referred case here for verification, adjustment, etc.

Here is that case as revealed by our records:

"21 times, 21 days, both sides (home Chiropractor). October 18th to November 9th, 1935. Then went to Mayo Clinic. 'Examined for 4 days and found nothing wrong

except that atlas was out of line, but thought it had nothing to do with the condition and probabilities are had had atlas that way all his life.' November 16, 1935, went to other D. C."

Case entered The B. J. Palmer Chiropractic Clinic January 8, 1936. Was given three adjustments as follows: 1/8/36, 1/11/36, 1/13/36. Atlas AR. R. Transverse Posterior.

Following are Daily Case Reports:

"1/9/36 Eyes are stronger. Hearing is not noticeably improved. Sense of balance a little better. Neck feels different than before, although cannot explain exactly how. Head noise is the same.

1/11/36. Eyes still weak. Used them for two hours and they became bloodshot, mostly in right eye. Neck aches on right side. Slight ache in head, behind right ear. No noticeable change in hearing or balance. Definitely feel and hear crack of right knee joint after it cracks.

1/13/36. Eyes much better. Head noises slightly less. Possible slight improvement in hearing in left ear.

1/18/36. Feel much better generally. Eyes much better, as well as hearing. Balance better.

"1/21/36. Feel excellent.

1/22/36. Hearing decidedly improved, both ears. Improvement in eyes."

Adjusting first left and then right was a variable. Being variable, it was not a constant.

If (a) vertebra was subluxated right, then it wasn't subluxated left. If it was left, then it wasn't right. If it

was either, it couldn't be both opposite directions, same day. One Chiropractor held opinion it was both opposite directions same day every day for 21 days. No wonder the seeming necessity of pecking away every day on a variable from both sides.

If (b) atlas was subluxated right and this was "adjusted" first, then head turned over and "adjustment" given from left, and case went home with last peckment from left, then case went home with worse subluxation than when he entered office. Vice versa would also be true. Pecking on wrong side on alternate days is a variable constituting an inexcusable blunder. Adjusting from right, only when it exists as such in fact, is a constant which constitutes sound intelligent understanding of nature of atlas subluxation and its correction.

If (c) subluxation was right on Monday, and on Monday he "adjusted" from right first and left second; and subluxation was left on Tuesday and on Tuesday he "adjusted" from left first and right second, he would alternately, on opposite days, decrease and increase pressure and make case worse one day and perhaps better the next. (This would be questionable because no case needs "adjustment" every day on same subluxation. It is possible that pecking away on alternate side daily might increase readings.) Alternation would be haphazard, trusting to memory which side was first or last, yesterday or day before, therefore, no constant was used as a basic start or finish. It would be bad enough if he made a constant of which side was daily adjusted first for 21 days. Even this possesses elements of great danger, for

If (d) subluxation was right, and for 21 days he

adjusted from right first and left last, then each day he continued to make case worse. It is no wonder case suspected Chiropractor did not know which side atlas was subluxated to. Realizing he was getting worse, case left him and went to another Chiropractor who found which side it was subluxated to. No Chiropractor can build a business on variables of which this is a simple sample.

The following report received from case's father, 7/18/36:

I just had a report from —— and he is feeling fine and it has been quite some time since he has had any bad effects from his injury. He is working every day. I feel he will soon be completely recovered, and I am happy to report same to you.

INFORMATION CONSTANT

The B. J. Palmer Chiropractic Clinic has many acute and chronic complexed cases, who during their stay here pass thru many laboratories, under different department heads who have assistants, all of whom are conducting varied research on each case. Internes are also studying, observing, and learning how to professionally conduct such a Clinic. Each case has a right to know what each laboratory reveals. It is natural that each case should ask any or all such persons many questions. To permit members of our Staff, Assistants, or Internes to discuss any or all findings with each case would produce a babble of voices, one opinion being at variable purposes to others. Part opinions from many people, based on part information of case, could not be complete. All findings are placed in writing, on

record forms compiled in Case Folder. When case desires information he may ask Director of Clinic, Dr. Palmer. Case Folder is called for from files, facts are ascertained, one department with another, and information released to case, rendering one opinion which is a constant from one person who has all information, rendering an all-inclusive, all-department proof regarding progress made.

OFFICE IN LABORATORY

The primary and ultimate objective in Chiropractic is to get sick people well. Education, training, equipment, ability—all focalize to that end. Chiropractic results have accidentally and occasionally been done any old way, any old time, in any haphazard manner. Best Chiropractic results are attained thru efficient, competent methods and accuracy of work. X-ray equipment able to deliver precise spinographs becomes necessary without which the start is wrong. Accurate neurocalograph readings are essential to know when and when not to give adjustments. A shielded and grounded booth is essential without which that conclusion is in doubt. A level, squared and plumbed, precise X-ray equipment cannot be carted about the country, set up in a few minutes. A neurocalograph cannot be carried about as an ordinary piece of baggage, taken from office to homes and back again. A properly shielded and grounded NCM reading booth, costing \$1,000, weighing more than 2,000 lbs., cannot be made portable, fitted and fastened together to be energy proof, thrown into an automobile, transported from state to state or office to homes and back. One set of precisely taken spinographs is worth many sets having no correct interpretation value. One NCM reading

made with neurocalograph taken in shielded booth is of greater restored health value to case than would be "readings" with hand instrument taken in ordinary office or home. Correct interpretation of correct reading is better than incorrect interpretation of incorrect reading, the difference between "adjusting" when it should not, or not "adjusting" when it should be. In the past we have used X-ray equipment even to portable outfits; carried hand-sized NCMs to homes, state conventions, and "read" cases anywhere and everywhere, regardless of air-energy conditions. Any X-ray with NCM is better than no X-ray or NCM, but I now realize that such work possesses less preciseness and accuracy than work done in The B. J. Palmer Chiropractic Clinic under conditions far more efficient. Consistent to understanding, knowledge and ability we now possess and use, cases preferring my personal professional services must come here to receive them. This accounts for why ambulance cases, staying in Davenport at hotels, boarding houses, or apartments, are brought to the clinic via ambulance daily, even at additional cost to us, for spinographs, NCM readings, etc. I could go to homes, hotels, etc., with less inconvenience to cases and less cost to us, but also with less accurate and competent value to them. Consistent with latest scientific facts, I now rarely attend State Conventions of Chiropractors and attempt to put on clinical demonstration work where lives or health of cases are involved. I cannot place my reputation at jeopardy by "reading cases" and "adjusting" on Lyceum platform at \$10 per, realizing such work is not equal to my best and would not be productive of best I am capable of. In emergencies, I could do next-best as I have done for years, but I prefer not to if there is a better way to perform the better kind

of work. Old-time Chiropractic, all up and down the back, no matter how crudely given, was better than no Chiropractic at all; Chiropractic a la meric system was better than medicine; Chiropractic on atlas alone without X-rays or NCM was better than meric system; Chiropractic with ordinary X-rays and usual NCM is better than without them—but better than all are precise X-rays, neurocalograph, shielded booth, competently, efficiently, and accurately used. Difference between old and new is difference between rule-of-thumb, guess-work, and accurate, efficient, competent conclusions; between “adjusting” every vertebra every day without distinction, and now actually adjusting only the subluxation; between long time, maybe, to get well, and short time now to get well; decreasing percentage of former failures and now increasing percentage of successes. I do not close old door into old house we are moving out of, but I prefer to walk into open door of modern house we have just builded.

CONSTANTS AND VARIABLES IN REST ROOM

Vertebrae have an appositional anatomical constant, where two surfaces contact, fit, rest correctly, upon, above, or below each other. Muscles, cartilages, and ligaments are built of sufficient contractility and strength to overcome ordinary tests to them at and in juxtaposition to normal base. A concussion of forces, a sudden jar, a wrench or twist, an unusual and extraordinary external invasionary ignorant energy overcomes usual and ordinary internal resistant intelligent energy, and a subluxation variant is present. Usual vertebral subluxation is a traumatic variable. Unusual vertebral subluxation is a traumatic variable plus an

anomalous and/or pathological variant. Time and degree creates difference between usual and unusual, creating havoc on muscles, cartilages, and ligaments, all of which adopt new abnormal position and adapt themselves to accommodate it at and in abnormal base.

Usual or unusual vertebral subluxation drifts to a Chiropractor. He spinographs and analyzes "traumatic variable." His analysis will be usual or unusual according to whether he has usual understanding or unusual knowledge of its revealed or concealed potentials. In either event, he gives adjustment introducing external intelligent invasiory energy to overcome tension, pull and strain of muscles, cartilages, and ligaments from interior which hold it in abnormal position, aiming to correct it back to normal.

CONSTANTS AND VARIABLES IN RELAXATION

Let us watch the moving picture of what happens in average Chiropractor's office. Patient is told to "go over and lie down" on adjusting table. Chiropractor "gives an adjustment" instead of patient "taking" an adjustment. Sooner or later, this Chiropractor is giving treatments of various kinds, complains that Chiropractic isn't all it is cracked up to be, etc. What was wrong? He omitted care in securing patient's relaxation constant before giving that "adjustment." Neck was contractured, muscles taut, he was hitting a board. No wonder no adjustment took place, no pressure released, no case getting well.

In The B. J. Palmer Chiropractic Clinic, everything has reason for being; logic dictates use, constants simplify every department. Adjusting table was builded to meet a

constant, used to further its interests, viz., to make possible an atlas adjustment. Patient is adjusted to table; table is adjusted to patient. When table and patient are adjusted to each other, every muscle is naturally relaxed in body as well as neck. Now patient is ready for an adjustment—and gets it. Patient and table are adjusted as a constant to each other, after which internal relaxation is a constant occurring naturally. We never use or find necessary any artificial, external, variable treatment relaxation methods super-inducing forced relaxation from without. Relaxation must come from within or it is not a constant ready for adjustment. Chiropractor is ready to deliver adjustment because patient is ready to receive one. This is another seemingly petty detail which makes possible that “staying put” value which prolongs health-building requisites.

Human issues of permanent and natural value come from above downward and from within outward. Religion, life, health are examples. None can be shoved in from outside. Natural relaxation is the same. That makes it a constant. “Relaxation” forced from outside in and from below upward, with heat or other variables, is not permanent, natural, nor does it produce “that extra something with staying put value.” Few Chiropractors grasp that constant. They chase heat-relaxation-variable with shove-the-vertebra-anyhow variable, ad infinitum, to the downfall of everything Chiropractic except name. They find it “difficult to get sick people well with adjustments”; and, equally well, we find it so easy here.

There is a copartner constant between adjuster and patient for “adjustment” is a dual action divided by two

each giving one-half, after which subluxated vertebra assumes corrected position of articulation. Adjusting a vertebral subluxation is more than one person pushing a bone into place that was out of place in another. It is a perfectly timed question of invasion and resisting forces in opposition, in alternate people at a common split second. If patient and Chiropractor are both contracted, or if both are relaxed at same time, no adjustment could take place.

- a. Immediately preceding adjustment, patient must be contracted. Chiropractor must be relaxed.
- b. At moment of Chiropractor's invasion he must be contracted and patient must be relaxed.
- c. Immediately following adjustment, Chiropractor must be relaxed and patient must be contracted.
- d. With Chiropractor away from and off of, Innate in patient recoils, and it is during that recoil that innate "sets" subluxated vertebra to where it belongs.

It takes a second for the concussion of forces to deliver the movement or motion which will produce or reduce a vertebral subluxation. It would be folly, following adjustment, for case to arise from adjusting table, begin twisting, jerking, wrenching, and straining the new-normal position of corrected vertebrae; to put muscles, cartilages, and ligaments "to a test to see if it will stay put." It is good judgment to permit it to permanently reseal itself, to remain seated, to permit it to stay put in its anatomical constant articulation. To this end, The B. J. Palmer Chiropractic Clinic insists case must rest "not less than one hour"; relax, sleep if possible, in a quiet, peaceful rest room

provided for that purpose. By laying down, the adjustment has increased its staying-put value by weeks, securing a continuous flow of health-building mental impulse. By failing to lie down, the adjustment has temporary value decreasing its health restorative value. **The rest room increases the constant of correction and decreases liability of traumatic variable slipping back to old abnormal position.** To "punch the neck" and let case run to catch a street-car immediately after, is not sufficient to justify preparation of years of expert training to deliver an adjustment. After years of study, thousands of investment in equipment, service to build a practice, to know how and to be able to make correct the subluxated vertebra, and you carelessly let case undo all this by squirming off adjusting table, twisting neck, and throwing out what you spent years to learn how to put into corrected location. Millions of thots in preparation of how to adjust; not one thot of how to keep it there after it has been. Pound wise in preparation, penny foolish in preservation! Preparation of accuracy of technique, correctness of delivery, and perfect health service can be destroyed in an instant by lack of care of what happens immediately after adjustment has been received.

"Rest Room" in The B. J. Palmer Chiropractic Clinic means individual rooms, comfortable beds, fluffy down pillows, clean linen each time after use, dim lights in each private room, silencers on doors leading into or from dormitory, padded carpeted hallways, rugless waxed floors in each room, private keys to each door, warm in winter and air-conditioned coolness in summer, telechron clocks in each room (35 in Clinic in all departments). Rest rooms

help check out anomaly and/or pathology variables, all of which adopt new-old normal position and adapt themselves to accommodate it at and in normal base. None of this may be a constant or variable, but it is a means to an end of helping a constant and preventing variables. Appointments induce comfort, comfort leads to rest, rest produces relaxation, relaxation creates sleep, and sleep makes for adjustment constant. All builds for quietness, cleanliness, restfulness, relaxation, safety—and sleep! With none of these, we have a mess of variables and wonder why few cases get well. And those who did, would be in spite of rather than because of us; with odds against case rather than for Chiropractor.

First day new case enters our Clinic, upon being pre-checked, adjusted, and post-checked, is handed the following "First Day Daily Case Record." He then retires to rest room. Following noon he will fill out right portion of record and hand to us when he comes for second day's check.

Meanwhile cases read and respect advice given in left column. It answers majority of questions usually asked by ordinary case.

.Each day thereafter, cases are given blank "Daily Case Report Record" which requests them to give any and all information regarding observations of their conditions, regardless of whether they think it good or bad. If they note an improvement, we are glad they noted it. If they report what they think was bad, it gives us an opportunity to explain retracing, momentum, and the ways of Innate Intelligence and how she goes about it to get rid of destructive conditions.

CONSTANT OF DIMINISHING OBSERVATION

Patient enters Clinic with vertebral subluxation. Permanency of subluxation diminished mental impulse supply, growing permanent dis-ease in various organs, under many names, at peripheries of nerves under pressure and interference. Case comes to equipped Chiropractor for health. He spinographs, analyzes subluxation position. He reads NCM resistance interference, establishes time and place. Adjustment is given. Subluxation is enroute to former normal position. One adjustment may correct its position. Health will be restored if (1) subluxation remains in juxtaposition; (2) patient does nothing to throw it out; (3) Chiropractor adjusts it quickly if it is; (4) patient utilizes force once given to his sick body. Subluxation may again lose normal position any time under certain conditions, such as: (1) sleeping with head on twist; (2) dreaming at night with sudden jerks; (3) sudden wrenching of neck with distortions; (4) falls; (5) slips; (6) twists in accidents; (7) sudden turning of head to see something, etc. Any can occur at any hour, day or night, following first adjustment. When and frequency determine necessity of repeated visits to office of competent Chiropractor. Daily intervals permit adjusting it into position at once, and put restoration at work quickly. Long intervals permit subluxation to permit dis-ease to destroy rapidly. If Chiropractor and patient knew how long it would stay or when it would slip out, visits could be predetermined in advance. Unknown quantity makes necessary repeated checks to know. Neither knowing, case must be kept under observation for an indeterminable time until uncertainty has become certainty. If thrown out first day or second week, it must be adjusted again; otherwise, gain

made is lost, good accomplished is destroyed. If subluxation remains adjusted, then 50% of further recovery of getting case well depends upon other fixed factors such as: emaciation demands mental impulse supply to rebuild strength; if case burns it wastefully as fast as received, case would get worse. Paralysis demands mental impulse supply to rebuild depleted muscles; if case refuses to utilize energy if, as, and when given, muscles will take longer to be restored to normal action, etc. Case must stand by under experienced observation to see that everything right is done right, and nothing wrong is done. Weekly checks from our Clinical Department reports prove progress, retracing, or retardation of case, which proof proves what is wrong that holds case back, what is right that sets him forward. This accurate information keeps him from stampeding home because of wrong understanding of action of new concepts and thus failing to get well. Also, this proves to Chiropractor his interpretations and judgment of records are what accomplishes results. Length of time case stays and frequency of visits is too often prompted by cost, therefore case considers diminishing frequency of visits. Chiropractor is usually prompted by professional equation, therefore he knows best when time has arrived to diminish visits. Over and above either judgment which may conclude rightfully or wrongly, Innate in patient knows best, Innate being safe, reliable and final judge. That judgment is constant and is not warped by external variables such as cost, time, etc. Sick people are dependent upon adjustment and restoration following adjustment. When that day arrives when vertebra has staying-put value, where they are independent, a constancy of going home with safety margin has been established. Independency is dependent upon ability of Chiropractor to adjust "with that extra something with

staying-put value" and patient consistently following reasonable internal rules and regulations of Innate in the use of internal flow after he has it. No two Chiropractors or cases are alike, each case being a law unto itself. There comes a time in almost every case when he can be safely dropped from six days a week to every other day, then twice a week, tapering off to once a week; then perhaps once every two weeks. That time is determined solely by observation and checking accuracy of case records and what they prove.

THE CASE CONSTANT

Sick people come to The B. J. Palmer Chiropractic Clinic to get well. Chiropractic will get them well. Chiropractic requires judicious understanding of case constants and elimination of all case variables. Passing from healthy constant to sickness variables is the antithesis of law of living bodies. Recovery reverses process from sickness variables back to health constant from within. They paid the price from health to sickness. Will they pay to go from variables back to constant?

Case 75 was completely paralyzed in feeling and action below 12th dorsal. We told this case, restoring action and feeling, passing from variables to constant, he would have pain, discomfort, loss of sleep, etc. The subluxation was adjusted, pressure was released, permitted a restoration of transmission of mental impulse supply. This was 50% of getting well. Patient must now use those mental impulses, internally digest energy once transmitted to muscles and ready to be utilized. Case did. This was other 50% of

getting well. Between Chiropractor keeping channels open, patient using flood of energy when it arrived, case was getting well. It is one thing to open flood gates and permit water to flow on desert, and another for plant to absorb water, develop tree, blossom, produce and ripen fruit for human consumption. Nobody on outside of patient can do what he alone can do from inside. One hour of internal effort is worth a day of somebody on outside of patient massaging muscles or stretching legs.

Case 81 was different. He began to suffer pains within three days from first adjustment. He "just couldn't stand it," took aspirin, our laboratories proved it, and he was sent home at end of first week.

Case 75 is willing to pay the price of pain to get well. He is! Case 81 wouldn't. He isn't! We want the first type. We want none of second. First type will build our reputation. Second will ruin it. We want cases who can and will meet the constant, face it, take it on the chin, and help themselves draw from boundless resources within themselves, to get well. Second type will not because they want variables, resort to drugs, destroy NCM readings, make it impossible to render honest service.

Case 74 faced the diet constant. Diagnosed sugar diabetes. While here he followed the constant as we instructed. He refused to resort to anything else. He was anxious to prove or disprove HIO adjustments.

Diet has a constant. Innate in patient knows need of each cell, organ, body; chemical balance and unbalance. Educated doctor (including Chiropractors) does not know need of any cell, organ, portion of body—let alone all of it

—or chemical balance or unbalance. Innate in patient is a constant. Multitudinous theories held by dietitians outside patient are variables. Urine showed excess of sugar. Diet reduces amount coming in, therefore less to go out. If maintained, patient will starve for necessary chemical elements for that body. Starve long enough, and patient will die cured. The constant demands certain elements; gets them; with variable it cannot equalize and balance after it has them, because of subluxation. Certain organs work over-time, others under-time. Adjustment balances mental impulse supply, which balances mechanical activities, which balance chemistry of body. Under adjustments, Innate of patient demands sugar and Educated patient would prohibit it, thereby starving body faster. A cross between Innate constant demand and Educated variable diet refusal to supply makes them worse. Meanwhile, appetite calls for certain foods. Patient should have them. In the B. J. Palmer Chiropractic Clinic, we follow the constant: "Eat anything appetite calls for, so long as it tastes good, stopping short of being a glutton." Mental impulse supply from within is an intellectual energy constant; it will produce a chemical constant, from inside of patient, given time. What comes from his outside, is a variable and not good to follow. If Case 74 while here had refused to follow this rule, preferred to follow restricted diet plus adjustments, he would not have gone home well in eight weeks. (See Addendum No. 13.)

Case 61 was slowly on the mend. Subluxation was adjusted. Impulses were getting thru. In time he would have gotten well in spite of rather than because of himself. Case was commiserating with himself, feeling sorry for his condition; exercised self-pity, thinking how sick he was

and talking about whether he would ever get well, etc. Because of this variable always from within, he was not sleeping. No sleep, no rest; no rest, no eight hours of reconstructive rebuilding. We told him to quit thinking about himself, think of something else. He stopped playing fast and loose with his variables, let his constants work, he began sleeping; using constructively mental impulse supply liberated into tissues. From that on, he climbed rapidly. His constant had to be used from the inside. It wasn't a series of variables any of us could rub in, inject, or shove to him from the outside.

Case 78 was child "turning to stone." Adjustments were given. What was more natural than surplus bone substance would chemically dissolve and pass via kidneys or stool. It went via stool. (Read Case Report in Supplement 7.)

Case 71. Average spasms or epileptic case had been fed bromides of one form or another. Bromides do to spasmodic muscular contractions what sedatives do to nerve force supply mental impulse flow—inhibit and paralyze "norm" flow to below "norm." Case goes to Chiropractor. If permitted to continue bromides, similar condition exists as in sugar diabetes. Adjustments release pressure, restore below "norm" to "norm" flow, create a demand for normal action and Innate control of muscular contraction. If case continues bromides and continues to inhibit contraction, opposition exists between demand and supply results. Bromides paralyze efferent mental impulse flow, slow it down from normal and externally and artificially control muscular contractions. Adjustments restore efferent mental impulse

flow, speed it up to normal, and internally and naturally control muscular contractions. Take both (bromides and adjustments) and they stymie each other, react against each other. They are antipodal to and oppose each other; one slows down, other speeds up building a neutral. Case should be removed from all bromides. At first, increased frequency or severity of spasms may result because of taking case from paralyzing media. This is expected and case should be forewarned. As soon as mental impulse supply reaches "norm" and muscular contractility has reached stability, spasms will decrease naturally and fade out. The constant is internal restoration of flow and natural control of muscular contraction. The variable is external paralyzation of internal abnormal flow and artificial control of abnormal muscular contraction. Constant fights variable, variable fights constant; patient becomes neutralized battleground between medicine down and Chiropractic up, physician and Chiropractor. No patient in The B. J. Palmer Chiropractic Clinic is permitted to continue bromides.

BREATHING CONSTANT AND "ASTHMA" VARIABLE

When air pressure, with invasion and resistance, inside and out, is equal, we breathe without exertion or effort, for it takes little to tip balance either or both ways. When body oxygenation requirements remain normal and tubes thru which air enters and exits become abnormally diminished in diameter so that supply of oxygen is less than demand, then air must be force-pumped in and out which creates a wheeze and whistle. Degree of wheeze and whistle varies like size of pipe-organ pipes—larger, the

deeper; smaller, the higher. A vertebral subluxation reduces quantity of energy flow between brain and breathing apparatus, unbalancing a smaller amount of energy with normal quantity of matter. As a result, tubes become inflammatory, cystic, contractured, growths form in or on tubes or prolapses of muscular walls occur, any of which produces variables called "asthma."

Case 88 was sent to The B. J. Palmer Chiropractic Clinic with asthma. Breathing was difficult at all times. In periods, she had severe attacks. Chiropractor who referred case failed, because he permitted case to continue adrenalin which made adjustments valueless, if not dangerous. We were advised to permit use of adrenalin for temporary relief, choking being so bad that some external stimulant seemed a necessity. Adrenalin does stimulate for a few minutes, relaxes tissues, permits freer breathing; but afterwards depression sets in which drops effort to lower levels than before. We foolishly followed suggestion.

Contrary to established policy, we did not demand complete and immediate restriction of use of adrenalin, altho this was first case we had not so advised. We advised case to restrict use to lowest quantity as soon as possible, and to get off all as soon as she could. Case followed this advice reducing quantity by one-half, taking other one-half daily. From then on, case daily took reduced amount.

Case entered Clinic 3/4/36. Adjustment given that day. For first week, case did not get better or worse. Held her own. Beginning of second week, took to bed. Every night took adrenalin. All this time, NCM readings were unsatis-

factory. Progress of case did not please us or her. Case was getting worse. Was now bedfast.

Chiropractor who had failed sent her here for us to do what he had failed to accomplish. Yet here we were taking his advice to permit her to continue doing same here as at home. Here was "asthma" variable into which is injected adrenalin variable with the hope that two variables could make one constant. We gave adjustment releasing pressure, restoring increased quantity of mental impulse with case injecting adrenalin and paralyzing it as fast as she received it. It matters not whether Chiropractor be here or there. Geography does not change law of constants or variables. Behind adjustment is a mental impulse health constant. Of what use is it when variable kills it? Of what use sparkling pure flowing spring water if it is perpetually poisoned as fast as it issues? Under adjustment constant and adrenalin variable, she was rapidly made worse, more so than she would have been without adjustments. One adjustment plus adrenalin put her in bed in seven days. It matters little whether internal variable be asthma, diabetes, neuralgia, or gout; whether external variable be adrenalin, morphine, diet, or heat. As treatments, they give temporary relief but every time used, even alone, the greater is the major depression that follows. Patient can't take internal constant adjustment and at same time continue external variables of any sort if he expects to get permanently well. Constants and variables conflict in well people and it is infinitely worse in sick ones.

In middle of second week, seeing adjustments and/or adrenalin were not getting health but on reverse case was

now bedfast, we told her to quit drugs or go home. She wanted to stay until well. We permitted case to remain if ———. We went back to demanding complete cessation of any and all adrenalin. Case cooperated. On third day thereafter, a marked NCM reading showed. Second adjustment given 3/14/36.

From then on, case steadily climbed, got up and out, returned to Clinic and got well—a condition which could not have been brought about had internal natural released force constant continued battling external artificial variable drug. A Chiropractor can't battle adjustments against adrenalin or any other treatment stimulative or inhibitive method, and win permanent health; he can't pit mental impulses on one side and adrenalin on other with patient playing "no man's land" between, and expect either side to attain health. Cases get well with Chiropractic if Chiropractic is sole and only method used—and that if is what makes many Chiropractors fail, either because cases are permitted to continue drugs, or Chiropractor lacks courage in being firm, dismissing case unless his rule is observed. (See Addendum No. 19.)

Constant is plain and simple. Balance 100% energy against 100% matter, and you have 100% natural free and easy breathing function. Subluxation unbalances equation, cutting down energy to less than 100%. Matter (altho normal in quantity) is now too much for amount of energy received to keep it moving to normal speed to introduce sufficient oxygen for body demands, supply is reduced, hence carbon is not removed in sufficient quantities. To balance energy and matter is the constant. This the Chiropractor makes possible. Hundreds of "Chiro-

practors" flare forth with medical armamentaria in their offices; methods galore to stimulate or inhibit thinking they do what medical men have failed to do for centuries with same working principle. He fights to **destroy** effectiveness of Chiropractic by fighting to **buy** medical adjuncts at bankrupting cost and wasted time. Why? Because he thinks he sees immediate temporary relief and cannot see permanent cure as his objective.

Dr. Crile in laboratory research has determined stimulative and inhibitive effects of drugs upon electric potential, electric conductivity, etc. His terms are our nerve force or mental impulse supply. His conclusions are that drugs **do** stimulate and are followed by depressions of these flows. With this conclusion, we are justified in insisting our cases in The B. J. Palmer Chiropractic Clinic **do not** take anything while in our Clinic regardless of how necessary it may seem or how insignificant it may appear. Adjustment **liberates** flow and increases natural action. Drugs **paralyze** "block" flow and decrease artificial reaction. One goes forward, trying to get thru, to work; other is held back, can't get thru, and no work results. They fight each other, creating a neutral battle-ground of patient's body. Neither wins; both lose. (See Addendum No. 19.)

Drugs which have stimulative or inhibitive effect "block" transmission of nerve-force mental impulse supply flow, efferently and afferently, **directly**. That produces "blocking" noted in stimulation or inhibition. It has been generally construed that function (efferently) and sensation (afferently) were effected **indirectly** thru some unknown round-about chemical change which dammed something or other and this dammed something else and finally

reached the functional flow of energy, etc. It is now clear that drugs work directly upon nerve-force. (See Addendum No. 19, quotation "5" taken from P. 239.)

VARIABLE ON JAUNDICE AND ITS CONSTANT ON HEALTH

Case 93 entered Clinic 3/25/36. From head to feet, skin color of brownish yellow of lemon rind. Skin like tough leather. Here was a body, inside and out, full of excess secretions and excretions. Brain was loggy, body was stupid; no desire to go or move, etc. As sick as his body was, his Innate Intelligence was healthy, bubbling over with animation, action, function, ready to express itself. But Innate was imprisoned in his skull; sickness was down in the body. The constant was ready, willing, eager to go—subluxation was key to prison door. Adjustment was given. What might case expect? Bowels might run a diarrhoea; he could get sick at stomach and vomit much and frequently; skin might sweat a strong odor sweat. His entire body will be stirred up, upset; digestion will be on blink for a while; he will get weak for want of food. His rest will be disturbed. In fact, during this housecleaning process, it may come quietly and methodically; or Innate (now getting thru) might go on a rampage and upset things generally and rapidly. Patient was warned what to expect and to be pleased when any of it arrived.

Strabismus is medical example of variables. Cross-eyes. Four muscles regulate position of eye-ball, one on top, one below, one on each side. If muscle on inside of

eye-ball becomes paralyzed, eye-ball is pulled to outside by normal muscle. Surgeon cuts outside normal contracting muscle to make it as weak as paralyzed muscle on inside. Eye-ball now goes center. He ignores pathological variable and cuts constant. Or, muscle on inside may be contracted and pull more than normal muscle on outside. Surgeon cuts inside contracted muscle so outside one will pull back to center. In this he cuts variable and ignores constant.

Curvatures of spinal column are similarly dealt with. It is supported in equilibrium by layers of muscles on each side of vertebrae. 98% of curvatures are because of paralyzed prolapsed muscles on one side of contracted muscles on other. I know Chiropractors who seem content to duplicate surgical procedure. They treat contracted muscles so they prolapse and make one side as weak as other. Or, they treat normal muscles thinking to prolapse them so normal side will be as weak as prolapsed side. Both treat variables. Medical men could do no more. They think "to do something." They do! It were better to permit Innate to internally contract prolapsed muscles or internally relax contracted ones so both sides would be normally equal. This is the natural internal constant.

CONSTANT ON FEELING. VARIABLE ON "PAIN"

There is a constant on sensation. People who have no sensation are those with normal feeling and those with no feeling. Healthy organs have normal feeling and normal feeling has no sensation. We do not know we have an

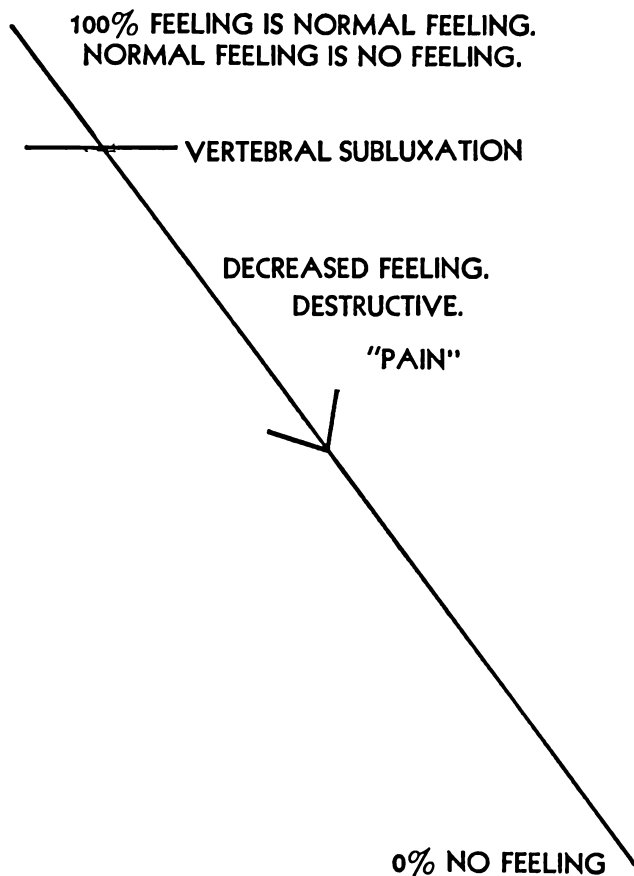


FIG. No. 28

Following traumatic subluxation, symptoms or pathology develop. Lack of function at periphery is result.

In ratio as function decreases from maximum to minimum, normal feeling decreases.

In inverse ratio, as normal feeling decreases, pain increases.

As dis-ease grows, normal feeling is on decline and pain is on increase on DECLINING side.

Eventually there comes a time when normal or maximum feeling will be gone. If so, there will be NO pain.

organ when healthy, for it is balanced in its cycles. When there is no feeling, we have no sensation, for cycles are completely unbalanced. The recovery of feeling is the transition between pathological no-feeling of 0 in the climb back to normal no-feeling of 100%. Recovery of feeling anywhere between is noted by pain in ratio as it climbs from 0 to 100%. Innate must have pain as a sensation in recovering from a pathology to know afferently what to do efferently. Pain is a mental interpretation of an abnormal external physical condition. Pain is in mind in brain. Without pain, Innate has no way of knowing what to do at peripheral end of efferent nerve. Pain is proof of understanding between what is not and what should be. To kill pain, by morphine, aspirin, or any drugless method, is to kill necessary condition which helps Innate know what, how, and where to do things necessary to restore health. If there were no pain in the climb towards recovery between pathology and health, there could be no recovery of health. Pain is a necessary internal pathological variable to reach and restore internal constant of health.

If Innate did not receive impressions from body, it would not know what was going on, neither could she build adaptative responses. When man is healthy and all is well, Innate must have impressions to know, to adopt and adapt. The road to recovery has pain. Innate must interpret them to know how to reconstruct function back to normal. (See Addenda No. 12 and 14).

Crossing legs is an example. Nerves are squeezed under one knee and over other. Legs "go to sleep," reducing feeling to 0. There is little "pain" in process of going from 100% feeling to 0. Uncross legs, feeling begins to be restored. It climbs between 0 and 100%, passes thru

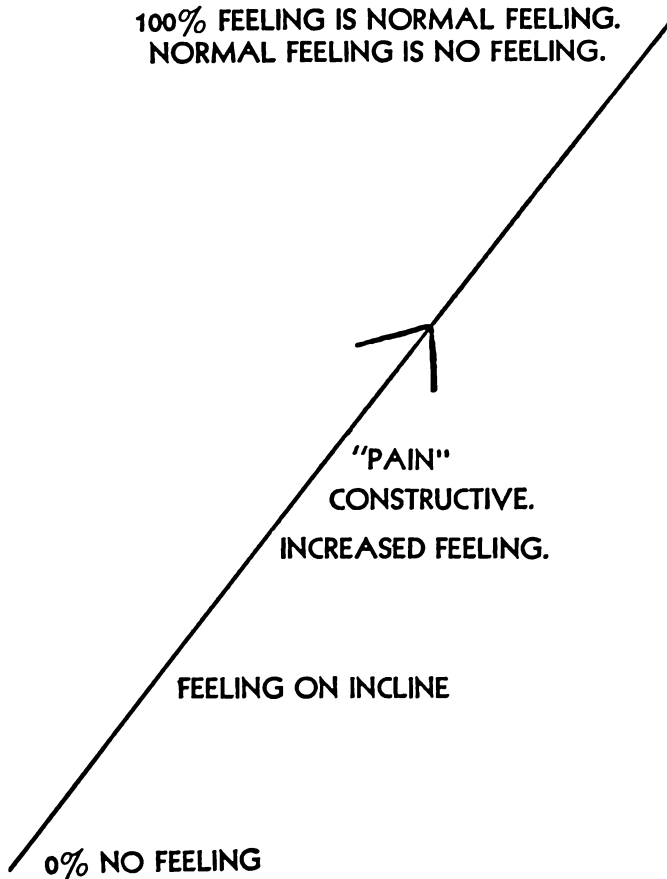


FIG. No. 29

When all function is gone, when it has reached zero, there will be no normal feeling, hence no pain.

Following adjustment, symptoms or pathology decrease. Increase of function at periphery, from zero to maximum, is result.

In ratio as function increases, normal feeling increases.

In ratio as normal feeling increases, pain increases

As health grows, normal feeling is on incline and pain is on increase on declining side.

Eventually there comes a time when normal (maximum) feeling is restored. If so, there will be NO pain.

process from 0 no-feeling to 100% no-feeling; from no flow to 100%. Process is pain, shooting needles, etc. To stop that pain would stop a normal process of restored function in muscles.

Chiropractors must discriminate between "pain" on declining side between constant of health and coming of variables from disease, pathology, traumas, etc.; and restoration of feeling on constructive side on inclining side, passing out of variables back into constant of health. So far as patient is concerned, "pain" is "pain" and he doesn't want it. So far as average Chiropractor is concerned, "pain" is something patient wants to get rid of. As disease grows, patient gets worse, feeling diminishes. He gets an adjustment, disease ungrows, feeling is being restored, a new kind of "pain" begins and grows in ratio until it passes halfway mark in its climb. Patient is quick to complain he is "getting worse," wants to quit, wants to "take something to stop pain," etc. If man could externally strangle flow of internal efferent impulses, between brain and body of another, that would be slow murder. That is what happens when vertebra is subluxated. In healthy man we have healthy afferent impressions with healthy feeling. To slowly strangle that afferent flow, if possible, would be murder to sensation. In sick man, we have sick impressions with "pain" feeling. To slowly strangle those impressions is to prevent life to that extent. Physicians give morphine and sedatives for that purpose. Is a Chiropractor any less when he attempts the same by any other route? To "stop pain" slowly or instantly is to "block" afferent transmission, to prevent sensation getting thru, to paralyze feeling. How it may be done, doesn't matter much, whether it be basephine or morphine, thumb or

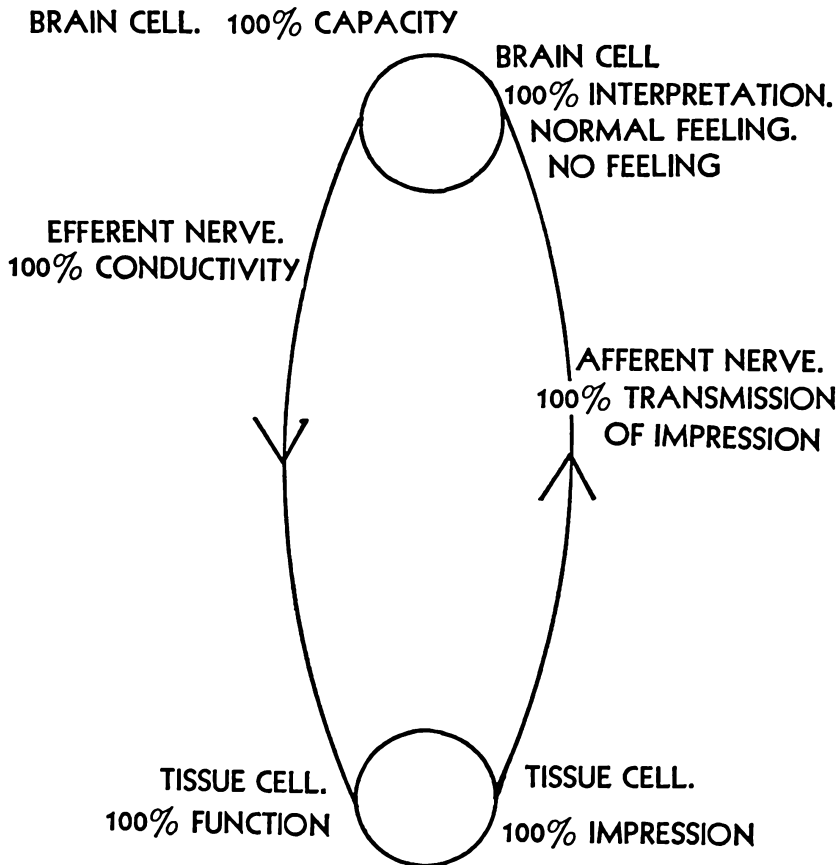


FIG. No. 30

A sample brain to tissue cell, tissue cell to brain cell, unit cycle.

If normal 100% quantity of energy flows thruout this material cycle, function and feeling will be normal. There will be NO pain.

needle. Rather than lose patient, average Chiropractor is interested in anything "to stop pain." To "kill pain" when on upgrade would stop NCM readings, stop case getting well, and in The B. J. Palmer Chiropractic Clinic it would stop our service. To "stop" restoration of returning feeling is to stop life flowing efferently, make it impossible to continue efficient, competent, accurate health service. If patient wants to practice variables, he can do so better at home than with us.

Recall the simple functional cycle. Afferent impression is equivalent to efferent function. 100% flows from brain. 25% is cut off by subluxation. 75% gets thru to periphery. 75% of function is present, 25% is absent. Impression is 75% feeling, 25% not feeling which travels to brain. There mind interprets it 75% normal feeling, 25% pain. 25% pain is what tells Innate what to do. Kill that 25% pain and you kill 25% recovery of case. So long as function is below "norm," pain is a necessity. Kill pain at periphery of efferent nerve and you kill ability of Innate to get case well. No wonder Chiropractors fail to get cases well because they do not know the constant and because of groping and playing with contrary variables. They suppress pain rather than permit pain until normal function has been restored, permitting Innate to establish the constant.

It is easy to ease, deaden or kill pain. It is done medically with many drugs given in many ways. It is done by drugless practitioners in many ways. My father had the most practical, simplest, quickest, and most positive method of killing pain anywhere within the body I have ever known or seen used. I know it. I have never used it. I

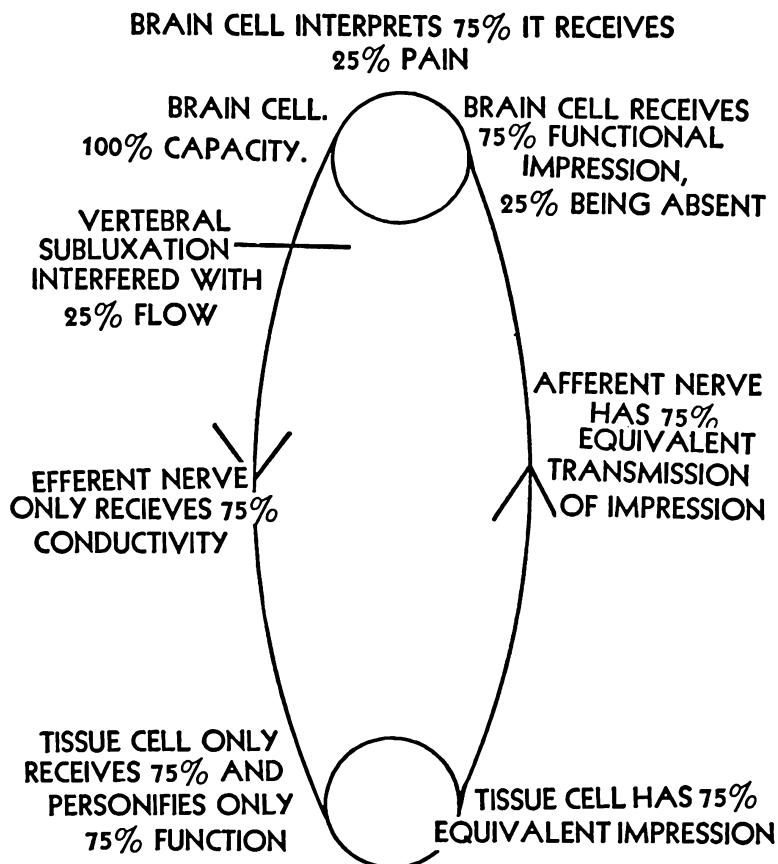


FIG. No. 31

Material elements of which sample unit cycle is composed are always present, whether active or inactive, functioning or paralyzed.

Subluxation occurs on efferent nerve leading from brain to body. It cuts off (hypothetically) $\frac{1}{4}$ of nerve supply.

From this point on, $\frac{3}{4}$ gets thru, $\frac{1}{4}$ does not.

From that point on, 75% function IS present, 25% IS absent.

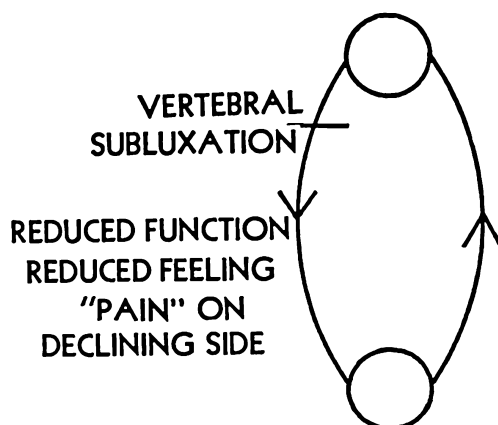
Impression and interpretation, on afferent side, is equivalent to efferent function from which it has origin. Being 75% function, there could be only 75% impression. When interpreted by 100% brain power, normal feeling will be 75% and "PAIN" will be 25% because that is the absent quantity of normal feeling.

refuse to be a party to killing pain in cases that are on the climb. The laborious and tedious thing is to restore feeling and to get Chiropractors to understand that constant. I have consistently fought to restore sensation from below normal up to normal feeling which is no-feeling. I know case wants to get rid of pain, but there are other things more important, viz., restoration of normal 100% feeling function. Health cannot be restored without going thru process of pain. Any Chiropractor who persists in killing pain, no matter how, makes it impossible for Innate to know how to get that case well. No wonder Chiropractors grope for constants, have it, and spend money to kick it out of commission.

Cases and physicians have been trained to think, believe in, use, and treat declining pain variables. When getting sick or getting well, they think all are the same declining variables. Cases and physicians are not trained to think constants, so neither think of necessity of restoration of feeling inclining pain. When cases go to Chiropractor they expect variable treatments stopping pain, and can't understand why he prefers constants with pain. Path of least resistance is for Chiropractor to agree and practice variables. If they want pain killed, kill it. Medical men did not get them well with pain-killing variables, neither can Chiropractor. Only judicious use of a constant can. In The B. J. Palmer Chiropractic Clinic we deny all variables and affirm the constant.

Average Chiropractor, notwithstanding his education, is like average physician—quick to find what case wants and endeavor to gratify it. Because average Chiropractor plays with variables which ease pain, patient is delayed,

BEFORE ADJUSTMENT



AFTER ADJUSTMENT

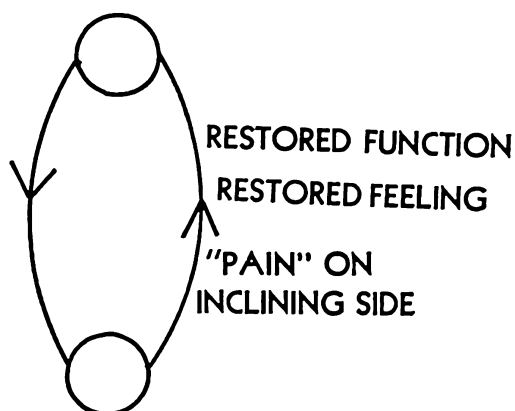


FIG. No. 32

By combining explanations given in "C" and "D", reader can understand what we mean by "pain" on DECLINING side as dis-ease (symptoms and/or pathology) is being developed from minimum to maximum. Same holds true with what follows after adjustment with "pain" on INCLINING side as dis-ease (symptoms and/or pathology) disappears from maximum to minimum.

prolonged, and perhaps never does **get well**. He is relieved. Physicians do as much.

Patients come to The B. J. Palmer Chiropractic Clinic to get well. **To get well** requires whatever **pain** is necessary by Innate going thru process of recovery. Nobody here will do one thing to suppress, deaden, or kill necessary recovery pain. We permit Innate to know **pain** to get case well.

RECORDING CONSTANTS AND VARIABLES WITH THEIR COMPARISONS

Memory is fickle. As a witness under oath, recall an accident that happened, two or three years ago. Hazy on detail? Forgotten much? Several people see the same accident which happened **one way**, but they'll give as many conglomerated messes of variable answers as there are people. Ask the average Chiropractor how he adjusts, where he adjusts, and why; what percentage of cases got well, better, or worse; what his books reveal on open accounts; who owes, or doesn't, how much or little, and much other information to build office constants vs. variables. He will gaze hopelessly at ceiling, act natural, and guess offhand ideas. Few keep records. Guesses what he wants to remember. He will attend conventions and boast conclusions unworthy of practical value. This is why our profession practices so many variables; none research, seek facts, want to know; none record, therefore all guess, think, hope, believe, guess-so when they talk "results."

The Chiropractic profession has **never** had any source of reliable, accurate, scientific, laboratory statistical data

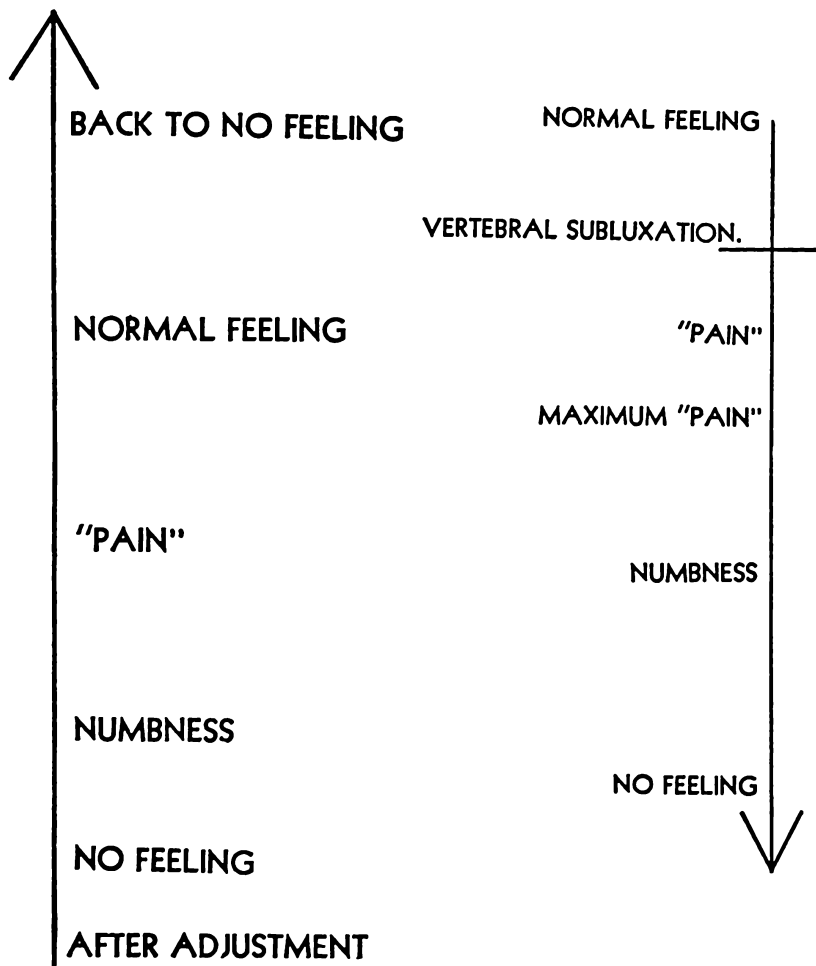


FIG. No. 33

By "No Feeling" is meant the minimum of normal feeling. We are not consciously aware of maximum "normal" feeling. We DO feel, but not with constant understanding or knowledge. When there is complete paralysis of transmission of function there would be minimum or zero of NO feeling which would be opposite of "normal" feeling for it would be complete cessation of ANY feeling.

it could quote with assurance it was based on information gained by use of constants and elimination of variables. From time to time, questionnaires have been mailed, with definite questions asked. Answers were received, tabulated, broken down. Percentages were established. I gathered the most of these, with this difference: I fought as hard as I could to make them as true to facts as I could by culling as far as I could from the material at hand.

August 4, 1935, an institution was founded, is being conducted and developed to meet that situation. In The B. J. Palmer Chiropractic Clinic every item, no matter how large or small or seemingly insignificant, is recorded, filed. Our work is no different than any other series of laboratories where work of many kinds is done by many people in many ways, none of which is allowed to get cold before it is a matter of record on blanks especially printed for those purposes. No matter what test, there is a constant sought and variables to be eliminated.

In laboratories, no loud talking is permitted because it would introduce external variable changing "norm" constant record of cases having tests made. Internes are disciplined to respect the silent constant, for same reason, while on duty. We restrict visiting hours to prevent strangers introducing unnecessary conversation noise variables during laboratory work hours.

The foundation objective of this Clinic is the exacting use of instruments which make automatic records. Scientific work establishes constants, eliminates variables and records the research for future reference. Upon these facts we are able to establish scientific statistics with data subject to review by laboratorial experts who would care to

or who would dare to study them. Before adjustment, we can tell in exact terms to what extent, the exact conditions, from the records. The adjustment can be told in exact terms, what was done, where, how, why, and its results, from the records. After adjustment, we can tell in exact terms, what changes occurred, where, to what extent, why, and do it all from records. Upon leaving Clinic, a form record is made of analysis, adjustment given, etc. This is sent Chiropractor who referred case to us, thus he is enabled to continue what our research constant has revealed.

A case file is builded, with all research data pertaining to that case in that file. Each group of records is separated by its own folder. Every week a new group of additional records is made and filed. Comparisons are established and recorded. Every two weeks additional spinographs are taken, records made, and comparisons established and recorded. Each action has an individual record. The comparison changes have an additional record. So much can transpire on each case in one week that no one mind could retain it, much less remember it then or in months or years to come. Records cannot forget or mistake. Some day all this data on file will be subject to review, ready for future statistics, and when it is, it will prove that before and after HIO adjustments, exactly, correctly, competently, and honestly given have proved what D. D. Palmer and B. J. Palmer Chiropractic can do by what it has proved itself to have done. (See numberless forms in illustration No. 34.)

THE CONSTANT OF ENERGY FLOW

Light emanates from an electric globe. Its physiology is simple. Flowing energy thru a completed circuit. Flow-

ing energy meets with resistance of tungsten wire, white heat is produced by work of forcing itself thru, from which comes white light. If current is continuous and steady, we get continuous, steady light. If current is broken in continuity, therefore unsteady by alternately make and break, increasing or decreasing its quantity, then **quality** of light would fluctuate up or down, off or on, light or dark. The objective of electricians, electrical engineers is to produce a steady continuity flow of electrical current thru a continuity of matter to produce a steady continuity of light. Objective of customer who buys electrical service to use in factory, shop, office, or home is a steady continuity of electrical service energy flow manifested as motion, heat, light, etc. To produce a constant flow is the ultimate. To produce variables of unsteady broken continuity flow, waving up and down, is to never have any known quantity of light at any time to do any definite work. (See Addendum No. 23.)

According to Crile, man is electrical, possessing potential, conductivity, and capacity. "Action of tissue cell protoplasm" is electrical function. "Life" emanates as a result. Its physiology is simple. Flowing energy thru a completed circuit. Flowing energy meets with resistance in tissue cell protoplasm, oxidation takes place, heat is produced, from which comes life. If nerve current is steady, we get steady life. If mental impulse current is vacillating by running up or down the scale, life fluctuates and would be on and off at differing periods of minutes, hours, days, weeks, or months. Objective of builder of this man-house and objective of tenant who lives therein, is to possess a steady flow of electrical potential, conductivity and capacity

that he might have a steady flow of life, health being a by-product.

Dr. Crile, in "The Phenomena of Life" (See Addendum No. 19) has gone to extreme scientific laboratory ends to prove drugs stimulate and depress this inherent internal flow of electric capacity, conductivity and potential. Grant drugs do this, why should any person want it done? Answer is simple: he is sick, he suffers because energy currents are permanently in a state of stimulation or inhibition. What sick man wants is the opposite. If suffering with stimulation, he wants inhibition; if dis-ease is inhibition, he wants stimulation. Example: if heart is temporarily or permanently beating too fast, slowing down living, he wants it slowed down to increase living; if beating too slowly, he wants it increased. Drugs have been isolated which have been proven to do this. Dr. Crile proves that drugs do increase or decrease mental impulse nerve force flow supply thru nerves from brain to body and body back to brain.

Physician approaches man, not with any idea of internally generating or creating new or more electric capacity, potential, or conductivity, so much as to change its present abnormal capacity, potential or conductivity to what he thinks it should be made over into thru the process of bringing it down if he thinks it too high, or bringing it up if he thinks it too low, doing these by external arbitrary means. That he can do this with drugs is admitted. To produce a constant flow is health. To produce variables of unsteady broken continuity flow, waving up and down from day to day in "try this, try that," is to never have known health as a consistency of continued time to do definite

work in any organ of the body. As well have a million dollar whiskey stimulated mind at night with a dark brown nickel taste the next morning, as to have a man stimulated today and in the depths of inhibited despair tomorrow.

To medical men there is no source within the human body that constitutes an energy constant. They have been taught that none such exists either inside or outside. The nearest that can be established is to manufacture one by external arbitrary laboratory drug means. Dr. Crile, as one of the most advanced thinkers, has out-distanced the vast majority of his profession. He observes a potential, capacity and conductivity energy. He does not see it as an actual internal working reality used to restore health. He sees excess or diminished capacities, potentials, and conductivities at nerve peripheries. He sees a necessity for its being stimulated or inhibited in professional practice. The rest of his profession will trail centuries behind him. How different is the Chiropractic principle and practice. They realize and recognize a source that exists within the human body as an intelligent energy constant. It is a working reality which can be and is being used. We definitely locate and correct cause of interference between constant in brain and variables in tissues. Chiropractor who confines himself to Chiropractic is today as far ahead of Dr. Crile as Dr. Crile is today ahead of his profession.

Consider two practices, how they work at opposite ends, observing same facts, yet one fails, other succeeds.

1. Water flows spasmodically. Why? Because pump works spasmodically.

2. Pump works spasmodically. Why? Because electric motor rotates spasmodically.

3. Electric motor rotates spasmodically. Why? Because electricity flows spasmodically.

4. Electricity flows spasmodically. Why? Because interfering medium makes and breaks free, full, normal, steady flow of electricity.

There are methods, the use of which can determine flow of water, regularity or irregularity of its quantity, pressure, and beat; can determine frequency or infrequency of pump ups and downs; can determine revolutions per minute (RPM's) of motor; can meter the kilowatt hours of electric current.

Obviously, if water flows spasmodically, pump works spasmodically; if pump works spasmodically, motor revolves spasmodically; if motor revolves spasmodically, current flows spasmodically. One parallels other; no more, no less. With current off and on, motor will be off and on; with motor off and on, pump will be off and on; with pump off and on, water will be off and on.

Which end—water or electricity, electricity or water—shall an investigator study, to learn, to investigate, to research, to understand why crops don't grow, live, and multiply? Which is cause, which effect? In observation, each would see the same symptoms or pathology regardless of whether he started at water end and followed it backward to electrical beginning, or started at electrical beginning and followed it thru to water ending.

If crops don't grow, live, and multiply, starting at in-

terfered water end and treating water by stimulation does not increase water quantity, therefore failure to "cure" the dis-ease. If crops don't grow, live, and multiply, starting at interfered electrical end and adjusting normal flow by restoration would increase everything from there forward, therefore success with health.

Consider a simple human anatomical-physiological picture, observing same facts; yet one fails, other succeeds.

1. Blood flows spasmodically, jerkingly; at times strong, other times weak. Why? Because heart-pump. works spasmodically.

2. Heart pump works spasmodically. Why? Because muscle motors contract and relax; at times strong, other times weak.

3. Muscle motors contract and relax; at times strong, other times weak. Why? Because mental impulse human electric nerve-force flows spasmodically.

4. Mental impulse human electric nerve-force flows spasmodically. Why? Because an interfering medium makes and breaks free, full, normal, steady flow of mental impulse supply.

There are methods, the use of which can determine regularity or irregularity, frequency or infrequency, pulsation, pressure, and beat of blood supply of body. This is study of effects, symptoms or pathology, dis-ease per se.

Obviously, if blood flows spasmodically, heart works spasmodically; if heart works spasmodically, muscles contract and relax spasmodically; if muscles contract and relax spasmodically, current flows spasmodically. One parallels

other; no more, no less. With nerve force flow interfered with, muscles slow down; with muscles slowed down, heart will be affected; with heart working abnormally, blood flow is abnormal.

There is nothing wrong with the water, pump, motor, or electricity, except there is too much one time, not enough another; too fast one time, too slow another; RPM's were too rapid one time, minus another; electricity is jerky. What each needs is to be balanced, steady; an even flow of electricity, a steady action of motor, a consistent pump, after which water will flow regularly. Beyond interference, flow of energy is wrong. Behind interference, there is an abundance of current. Adjust the interference and from there on all will be normal. Why agitate irregular water, jerk and pull on pump, fiddle with motor or tamper with wires or current? Treatment of effects gains nothing, permanently.

There is nothing wrong with blood; heart is in material normality; muscles are capable of acting; nerve-force is potentially normal. At times all of them are jerkily too fast; at other times they slack down and go slow. Nothing material is wrong. What each needs is proper balance, being steady; an even flow of mental impulse current, a steady contraction and relaxation of muscles; a consistent pump of heart, after which blood will flow evenly and regularly. Efferently, from interference of energy, all is wrong. Behind interference is abundance of power in brain. Adjust atlas subluxation interference between brain and body, and from there on all will be normal. What is gained by agitating blood that isn't flowing correctly; pushing and pulling on heart won't help; massaging muscles

won't make them contract and relax naturally, and hypodermically injecting drugs into nerves won't give more current to carry. Treatment of effects gains nothing permanently.

Which end—blood or nerve-force, nerve force or blood—shall an investigator study to learn, to investigate, to research, to understand why life doesn't grow, live, and multiply? Which is cause, which is effect? In observation, each would see same symptoms or pathology, regardless of whether he started at nerve-force end and followed it forward to blood, or started at blood end and followed it backward to nerve-force. Beginning or ending, it is a question of working from cause to effect, or effect to cause; generation to expression, or expression to generation. It is a question of anatomy of material substances; philosophy of abstract equations of energy; or a combination of abstract and concrete elements equally and properly balanced in relation and ratio to each other, producing a normal physiological action of matter.

Chiropractor studies cause—mental impulse, nerve-force, human electricity supply. With scientific apparatus, he measures flow of energy, measures its behavior. He is not directly interested or concerned in blood end, knowing that if current is interfered with, muscles, pump, blood will automatically follow in kind; work normally if current is on; work abnormally if current is interfered with.

To stimulate inhibited blood flow, or inhibit stimulated blood flow, is to treat effects. To adjust cause of interfered mental impulse nerve-force human electrical current is to restore normal quantity and all else desired follows. One fails to get sick well, other succeeds.

Chiropractor approaches man, not with any idea of internally or externally generating or creating new or more electric capacity, potential, or conductivity. This was done in the beginning by the Creator, not only in the Universe but also in Man. Chiropractor knows that capacity, potential, or conductivity of energy flow is abnormal in sick man, at times and in parts of him isolated from other parts. He does not know what capacity, potential, or conductivity of normal or abnormal in man is. He has no desire to use external or artificial processes of bringing it up or down to arbitrary levels. He knows internal natural forces will strike their life and healthy levels in all parts if they express themselves in all parts without interruption or interference. That normal level can be brot about by adjusting the interfering medium, from within, is Chiropractically admitted.

The ordinary and average physician knows no better than to stimulate and inhibit the inhibition and stimulation. He was taught that, accepted it as a true premise, practicing it as such. He sees such in symptoms and pathologies. He has no other route to follow. How different the ordinary and average Chiropractor. He has been taught the internal constant, the subluxation interference, symptomatic and pathologic variables, vertebral adjustment, and restoration of constant. He was taught to disregard symptoms and pathologies as aught but stimulated and/or inhibited effects. For him to follow medical routine is a crime to his conscience, to his profession which taught him otherwise, and to service he is capable of rendering. So long as human nature is what it is, we will find weak sisters in any honorable group.

How wonderful that "Nature" is a constant in spite of variable mistakes of physicians, variable blunders of surgeons, and incompetent variables of some "Chiropractors." Wondrous are the ways "Nature" works to save human life in spite of rather than because of mankind who serves variables to defeat a constant but never learns how. How much more wonderful that Innate Intelligence is a constant because of efficient, competent, and honest Chiropractors who seek the constant and work with it consistently and intelligently denying all variables.

Innate is an intelligent, always present, **internal constant**. Why look outside for an empiric laboratory one? "Chiropractors" who think to treat symptoms or pathology of disease to stimulate inhibition, or inhibit stimulation, by modalities, are attempting to do by external means **same thing** medical men **attempt to do** when they treat symptoms or pathology of disease by stimulating inhibition or inhibiting stimulation, with drugs. All either can do, by those principles and methods, is to whip up slowed-down current; or, slow down whipped-up current; hypo the hyper, or hyper the hypo. Each is taking unknown variables and by injecting other unknown variables tries to create an artificial external "constant." Why **try to build artificial external variables into a "constant"** that is not a constant, never has been, after 5,000 years, when a genuine, real, and known natural internal constant exists? Chiropractors, know there is an internal constant, that vertebral subluxation interferes with its steady flow, releases this obstruction, and permits internal constant that is to flow freely and without interruption to organ that was sick. **He restores constant from where it is to where it was not, all an internal capacity, potential, and conductivity.**

Of primary importance is that this balancing factor is **already inside man**. Why artificially, externally, attempt to introduce it temporarily by injection, pill, powder, or potion? It is better to find **interfering medium that shorts the circuit**, release that **interfering medium that changes steady flow to unsteady flow**, breaks the continuity to discontinuity, and permit a restoration of **steady flow** from where it is to unsteady flow, so that **entire circuit will be steady**. Why build a "science of medicine" which is admittedly empiric to try to find **what will** do this from outside when there is already a constant factor efficiently capable of doing it from the inside? Why build a "practice of medicine" which is admittedly experimentation to arbitrarily fluctuate **variables**, never fixing a constant from outside to inside?

Dr. Crile has proved the Chiropractic principle. Why doesn't he prove the Chiropractic practice?

SMALL CONSTANTS VS. BIG VARIABLES

A physician has a dozen ways to "diagnose" a disease, a hundred ways to "treat" it, a thousand kinds of apparatus to "cure" it. Which contrary variable will he use first? A Chiropractor theoretically has twenty-four vertebrae to adjust, throws in the skull and buttocks for full measure; a dozen kinds of adjustments which can be given in a dozen ways. Shall he start at top, between, or at bottom? Has one table for top, another for middle, and still another for bottom. These thousands of variables complex action, befuddle mind, perplex confidence, and leave Chiro-

practor and patient at opposite ends of a confused rope tied in knots.

By contrast, dis-ease is single; it has **one** all-inclusive cause, **one** adjustment at **one** place. We have **one** thing to do, **one** way, at **one** place, and have **one** table on which to do it; know how, and do it. That is seeking a constant. A competent Chiropractor **knows** what he seeks, how to find it, how to fix it, and when to stop.

"Chiropractors" say: "Patient is not satisfied with so little." If Chiropractor has proved that "little" and reflects confidence, ability, and delivers, then patient is a mirror in which Chiropractor reflects himself; patient reflects exactly what is delivered to him. When Chiropractor is confused, perplexed, befuddled, and demands variables because he has no constant, patient follows that lead and demands more. A Chiropractor who reasons, reaches fundamentals, involves logic, develops constants, is consistent. He does not wobble, straddle, or contradict himself. Forty years of research has delivered me from variable bondage. Forty years of dropping variable shackles and leg-irons has delivered me to the freedom constant. Today I know what to seek, where to find it, what to do when I get there; do it, and quit. I get what I am paid to find; the patient gets what he pays me to do; all are satisfied. The B. J. Palmer Chiropractic Clinic radiates confidence, knowledge, ability. This is because **we** have confidence, knowledge, ability. Patients in The B. J. Palmer Chiropractic Clinic absorb confidence, knowledge, ability because they **get well** because we have the constant that delivers it.

Getting sick people well is natural and is simple result

of competently locating exact cause and its correct adjustment; competently locating exact cause and its correct adjustment is attained by using efficient ability; efficient ability is attained by securing exacting knowledge; exacting knowledge is attained by eliminating diluting variables and building essenced constants; to perform constants is to be scientific.

WHO IS RESPONSIBLE?

Chiropractors are not totally to blame for weaving back and forth between one principle and practice and another, even tho conflicting and contradictory to each other. Jumping from one kind of principle and practice to another is bad for practitioner, patient, as well as modes and methods used, for it destroys confidence of all in all. When methods within themselves are young and there is much desired in development within one principle and practice, leaving incomplete much that is uncertain within itself, the follower is not entirely to blame if he too is unsettled and unanchored. To jump from Chiropractic to medicine, adjustment to treatment, subluxations to germs, interference to environment, inside cause to outside cause, inside cure to outside cure, from backbone to belly, are radical changes from one extreme to other. A part of this blame for professional external hoboing must be assumed by youth of the movement, its incompleteness, its future which had to come.

IS FORD?

Ford built a car twenty years ago. It did not contain long wheel base, self-starter, easy cushions, enclosed all-

steel body, electric head and tail lights, hydraulic brakes, nor did it make 100 miles an hour at 18 miles to gallon of gas. Ford knew the internal combustion engine principle was **all-inclusive**—one horse power or 100,000; a diminutive car or a giant of 100,000 horse power; one mile an hour or one thousand; the principle being correct, it was **big enough** to do all it was doing then or would be asked to do 50 years hence. Ford knew the internal combustion engine principle was a constant. Ford knew the application of that internal combustion engine principle was full of “bugs” as known in electricity; “things that wouldn’t work efficiently” as known in mechanics, or “variables” as known in science. Ford knew, as years wore on, he would apply his principle more accurately, efficiently, and competently, as he eliminated variables and reached his constant. How to do it was the problem. Correct application needed expansion. Momentary defeat (if defeat there was) was a momentary defect (if defect it was) was in those early doubtful days in Ford’s mind becoming less so as application improved: first, eliminate variables and establish constants; second, eliminate complexities and establish simplicity; third, amplify and multiply effectiveness of application on what was then being done in a small way. Time has proved correctness of this. Not being satisfied in results, had Ford been like many Chiropractors, he would have denied internal combustion engine principle and practice and stopped building. Did he? Ford **knew the principle and practice was right**. Ford stayed with that principle and practice, developing it year by year, and finally, 20 years later, brot it up to where he wanted it. Who but Ford can now say whether it has reached the coveted objective he set 20 years ago or has set now?

IS PALMER?

D. D. Palmer laid down a principle 40 years ago. It did not do, so long as he lived, what he wanted it to. B. J. Palmer realized shortcomings and began development of that well-laid principle into a scientific practice. It is not doing yet, as long as I have worked with it, all I want it to. Palmer knew internal Innate, vertebral subluxation, mental impulse interference, vertebral adjustment restoration mental impulse supply principle was **all-inclusive**—one man or a million; an individual or nation; healthy or sick; the principle being big enough to do all it had always done for the human race, was doing at time of its discovery, or would continue doing in years to come of its development—where, how, when to act were the problems. The Palmers, father and son, knew the Chiropractic principle was a constant. They knew the application of that principle was full of “comodies” as known to medical men, “errors” as known to scientists, “crazy notions” as called by Chiropractors, or “variables” as they should be properly titled. Palmer knew, as years wore on, he would learn how, why, where, when to lop off variables, one by one, and he further knew that in exact ratio as he lopped off variables he would reach his constant. **Correct application** needed expansion. Momentary defeat (if defeat there was) was a momentary defect (if defect there was) was in those early doubtful years in Palmer’s mind (becoming less so as application improved): first, eliminate variables and establish constants; second, eliminate complexities and establish simplicity; third, amplify and multiply effectiveness of application on what was then being done in a small way. Time has proved correctness of all this. Not being satis-

fied, suppose either of the Palmers had denied the Chiropractic principle and practice, stopped developing and practicing it, had hoboed into fields of conflicting and contradictory modes, methods, and means. Did they? The Palmers knew the Chiropractic principle and practice was right. They stayed with that principle and practice, developing it year by year, and finally, 40 years later, have brought it to somewhere near what each wanted it to be and do. Today, who but Palmer can say whether it has reached the objective one laid down 40 years ago, to be followed by the son shortly thereafter?

“TRYING” IS ONE THING FOLLOWING THRU IS ANOTHER

Many Chiropractors have “tried” NCM, HIO; have pre-checked and post-checked with variables and “have found nothing stable about them.” This is in part due to themselves and their faulty technique. But in light of continuous research, it might also be partly due to work done in immediate environment of gross electrical disturbances, external variables, and never have been able to make the “darned thing” work accurately, efficiently, or correctly from day to day. Other Chiropractors may have been more fortunate where such were not grossly present. In first instance, Chiropractor would get disgusted, quit using NCM, and fall back on meric system or some foreign and more uncertain method wherein he felt at home and at ease in its use. In second instance, Chiropractor would be delighted with results attained from NCM and HIO and nothing could take him from its highest stage of accurate, efficient, and correct use,

stepping-up his knowledge from year to year, until now he uses HIO on all cases. No fault lies in the Chiropractic principle and practice, it being right; nor does fault lie in the principle and practice of subluxation and adjustment of interference and restoration of transmission of mental impulse supply, all being correct. No fault lies in NCM and its field of work in doing all it claims to do; neither is there fault in conclusions of fact of HIO as being highest attainment method of getting greatest percentage of sick well quickly; but neither is practitioner in total error when much was concealed and hidden and yet to come to light. All that was wrong was that he was trying to make something work right, at a place and under conditions where it could not work efficiently, even tho principle and practice was right—and he didn't know it. Now all, regardless of where office is located, can work accurately, efficiently, correctly, and honestly if he knows how and what and why and when.

DILUTE CONSTANTS OR ESSENCE VARIABLES?

The Chiropractic principle is complete and a simple constant. Every Chiropractor and every Chiropractic publication since 1895 has lip-serviced tribute to that principle in his and its sales arguments to cases, in publications, signs, illustrations, before legislatures, everywhere, all the time. The principle is sane, sensible, and logical. The Chiropractic practice has been a series of variables from date of its birth. All Chiropractors have been practicing with variables, since 1895. He has run the scale, trodden the gauntlet, adding and subtracting, dividing and multiplying, simplifying and complexing, diluting and essencing variables.

There are two kinds of variable practitioners in our ranks: those who practiced variables **within** the Chiropractic principle and practice, and those who practiced variables **outside** the Chiropractic principle and practice. First researches to **apply** more correctly the Chiropractic principle **constant** to a **practice** variable. The second tries to **apply** more correctly the Chiropractic principle **constant** to a **mixed medical practice** variable. First **eliminates** variables. Second group **multiplies** variables. First works **towards** a **constant**, latter works **from** them.

The B. J. Palmer Chiropractic Clinic was established for practical research which applies itself to failure cases, which takes "impossible" case problems and laboratorically solves them because of before and after constant proof of what does and what cannot work. A physician inspecting our Clinic said the one thing which impressed him most was that, so far as he knew, it was the first Clinic in the world to confine itself to recording facts, obviating "hooey" and eliminating "hokum." Having visited many Clinics, he should know. There are many Chiropractors throwing theories into our practitioners' marts which many use and become bewildered and grab anything and everything offered for sale. Proof is not offered, neither does practitioner ask for any. Given time, if observant, he finds his practice going to pieces because cases no longer get well. The solution of every practitioner's practice, both professionally and financially, lies not in seeking results outside of Chiropractic principle and practice, but inside the purview of that principle and practice by subtracting multitudinous complexed variables that run wild in his mind and office suite and by multiplying multitudinous simple con-

stants within that principle and practice which have heretofore been secrets which we are unearthing, developing, and proving. If any man advocate a theory, which all believe works yet none has proved, all scamper to see who can get it first. If any man advocate another theory, which all believe works yet none has proved, and proof proves it does not secure result desired, then proof has spoken. If another man perform a service which many believe cannot work, yet none has proved, and he introduces constants via scientific before and after proof, then proof proves itself. To look, seek, hunt for solutions of failures is the procedure of wise men. To look, seek, hunt for solutions of failures and reach any conclusion stated as fact without proof of fact, is the procedure of fools. Far from being details of minor importance, they are actually essentials. They must be complied with—correct results are not possible otherwise.

This is the first Chiropractic Clinic to be established to scientifically ascertain constants, premised upon before and after proof data, therefore it stands today foremost as indicative of our future.

SUGGESTION

Building a "properly grounded and completely shielded NCM reading booth" is exacting and scientific. Carelessly slapped together room will defeat its purpose, be a camouflage and subterfuge, and might "talk" nice but fail to deliver results demanded. Every square inch of air surface outside must be protected against internal invasion. In The B. J. Palmer Chiropractic Clinic NCM shielded booth,

ceiling, side walls, floor, door, etc., are exactly protected. Floor is covered with $\frac{1}{16}$ " pure copper wire screen over cement and under battle-ship linoleum, running up and overlapping side wall screen. Ceiling screen runs down and overlaps side-walls. Door is covered and overlaps on to copper weather stripping on sides and top. All directions are soldered. No single piece but what is soldered into one continuous copper shield. The only single unprotected section is door sill. Even here bottom of door fits closely to sill. Entire room is soldered to heavy copper wire carried and soldered to nearest water pipe carrying water flow. In building our labs and booth, we consulted radio and electrical engineers of competency. If in doubt as to building a shielded booth, consult a competent electrician. Don't ask an "electrician" who sells groceries, runs a bath house, drives a taxi, and gives adjustments evenings as side lines. Engage an electrical engineer who knows his business!

If interested, visit The B. J. Palmer Chiropractic Clinic during visiting hours (12:00 to 12:30 noon, and 5:00 to 5:30 P. M.), and inspect ours.

ADDENDUM NO. 1

INTERFERENCE

The Victor Electrocardiograph, although portable, has the high degree of sensitivity characteristic of other apparatus of this type. This sensitivity means that the instrument is somewhat susceptible to stray electric fields such as those produced by X-ray machines, high frequency equipment, faulty wiring, and conductors of large currents. No rule

can be laid down as to the probable presence or absence of an affecting stray field. This can only be determined by trial.

While the instrument itself is thoroughly shielded, it is quite possible for the patient, acting as an antenna, to pick up electrical disturbances, which will be recorded by the instrument. The best method of controlling disturbances is to enclose the patient, operator, and instrument in a cage composed of fine metal screening.

Where the electrocardiograph is used constantly in one location, the question of interference is much simplified, as results of it can be studied, made known, and readily extrapolated.

Where the instrument is used in its portable character, each location may bring a different problem. It will be necessary to study the electrical situation and make every effort to reduce this interference by cutting off electric lights and domestic appliances, such as heating pads, vacuum sweepers, sewing machines, etc., during operation of the instrument.

(Copied from page 12, Book No. 27, in The B. J. Palmer Chiropractic Clinic Library.)

ADDENDUM NO. 2

The "Lie Detector" (The Scientific Monthly, January, 1935): "An instrument of this type (polygraph) should be distinguished from the numerous other so-called 'lie detectors' frequently found in the psychology departments of many universities. Usually such experimental devices con-

sist of a galvanometer and Wheatstone bridge—an instrument for detecting the psycho-galvanic reflex, that is, the changes in skin resistance when an imperceptible current of electricity is flowing thru the subject's body during the period of questioning. The galvanometric change in the body serves as an extremely sensitive criterion for emotionality, but cannot by itself be depended upon as a means for the detection of deception. Used, however, in conjunction with the other two reactions, it may be of considerable assistance."

(Copied from Book No. 34, in The B. J. Palmer Chiropractic Clinic Library.)

"Debunking the 'Lie Detector'" (Leonard Keeler, *The American Journal of Police Science*, May-June, 1934): "In detecting deception, the same general procedure is followed. Certain situations or conditions produce emotions which are accompanied by bodily changes. The flushing of anger, and the paling with fear, for example, need no introduction. But to discover, measure, and evaluate the less obvious bodily changes which accompany the emotions involved in deception requires just as much specialized care as the physician must exercise in making a complicated medical diagnosis.

"Altho little is known concerning the mental processes involved in deception, the apparent effect is observed in the bodily changes accompanying the emotion of fear, primarily fear of the consequences of exposure. Awareness on the part of the guilty subject of the procedure and of the resultant physiological changes intensifies this fear, thereby further accentuating the accompanying bodily changes. Then often a conscious effort is made to prevent exposure. A

subject familiar with the principles underlying the deception test will frequently attempt to suppress any physical changes and, in so doing, affects certain semi-autonomic muscular movements. If the test procedure is properly controlled, the innocent subject will have no fear symptoms, and therefore will make no conscious effort to control non-existing physical disturbances.

"The impossibility of observing or recording mental processes as such necessitates the indirect method of recording the bodily changes which accompany most mental activity. Physiologists and psychologists have endeavored to correlate physiological and cerebral manifestations, with a fair amount of success. It is well known that most conscious mental disturbances have their physical correlatives, although absolute specificity is yet undetermined. Certain of these physical changes are under **voluntary** control, such as changes in the skeletal muscles, while others are quite autonomic and **involuntary**, such as in pulse rate, blood pressure, activity of the sweat pores, salivary glands, pupillary reflex, blood chemistry, etc. Respiration is also involuntary, but consciously controllable to a certain degree. All of these involuntary physiological processes, and often the voluntary musculature, come into play with mental activity. Mental and physical processes are integral parts of the whole animal mechanism, the functioning of one depending upon the other. Therefore, in determining the processes involved in deception and concealment, certain of the voluntary and involuntary bodily processes are recorded, and used as criteria for diagnosis.

"In the dawn of science, certain outward manifestations, accompanying fear, anger, rage, and other emotional

states, were noted; in more recent years, many additional symptoms of emotionality have been observed and recorded with highly developed physiological and chemical techniques. Many police investigators, and even jurists, base their judgments of innocence or guilt on behavior symptoms. Judges in court are permitted by law to call to the attention of the jurymen these various physical manifestations of witnesses or defendants. Frequently these outward manifestations are symptoms of deception, or guilt, but they may be confused with embarrassment or fear.

"Psycho-physical patterns are more easily and accurately revealed when all of the known symptoms can be observed and continuously recorded for study. Many outward manifestations can be controlled, hence the necessity of using instruments for recording the internal involuntary changes. The more of these physiological processes recordable, the more complete will be the symptomatic pattern. Nerve impulses, blood-chemistry, stomach or intestine peristalsis, glandular activity, etc., cannot be easily studied without discomfort or injury to the subject, but certain secondary changes related to these more obscure manifestations can be recorded quickly, accurately, and harmlessly." (Copied from Book No. 33, The B. J. Palmer Chiropractic Clinic Library.)

ADDENDUM NO. 3

The General Electric Company, in their Research Laboratory, have researched the question under discussion and have issued an article "Ionization of the Atmosphere and Its Biological Effects," by Lewis R. Koller, Ph.D., from which we extract paragraphs and sentences, insofar as they bear on the subject under discussion:

"Air conditioning at the present time consists in the attempt to control temperature and moisture content of the air inside buildings, as well as the elimination of dust and unpleasant or harmful gases or vapors. Another atmospheric factor which may possibly have considerable bearing on human well being has been largely overlooked so far. This factor is the electrical condition of the atmosphere. Evidence has been acquired recently which indicates that this factor may be important, and, therefore, it may be desirable to attempt to control it artificially. Before discussing the evidence and the methods of producing and controlling atmospheric electricity, it is necessary to describe the normal condition of the atmosphere and the various methods of investigating it experimentally.

"The first investigation of the electrical conductivity of the atmosphere was made by Coulomb in 1785. Coulomb studied the loss of charge by a metallic conductor in air. Previous to this time it was thought that this was entirely due to faulty insulation and that a perfectly insulated charged body could maintain its charge indefinitely. Coulomb showed that the loss was not entirely due to insulation leakage, but in part also due to conduction through the atmosphere, although his theory of the nature of this conduction was erroneous.

"About a century later, in 1887, Linñs also investigated the conductivity of the atmosphere and found that it was greatest in fine weather, and, furthermore, that it showed a seasonal variation."

"In addition to the current which flows under the influence of the atmosphere's potential gradient, there are

also localized convection currents due to the motion of charged masses, such as fog, rain, snow or dust, and the like, and also the large currents due to lightning discharges.

"The conductivity of the air is due to the presence at all times of large numbers of ions or charged particles: In general, the number carrying positive charges is slightly larger than the number carrying negative charges. The number of ions is also subject to great fluctuations from hour to hour and from place to place. In any one place it shows a daily as well as a seasonal variation. It is usually largest when the air is clear. It is larger in summer than in winter; larger during the day than at night, and when the temperature is high than when it is low. Unlike the potential gradient, the number of ions increases with increasing elevation. At very high altitudes the number becomes very large and the conductivity becomes very great."

"Since the dimensions or masses of the ions cannot be measured by any direct means, it is customary to describe them in terms of their velocities."

"These measurements are particularly difficult to make in atmospheric air due to the very weak ionization."

"We will now turn from the consideration of the electrical condition of the atmosphere to the biological effects of atmospheric electricity. This field is relatively new. It is rapidly being explored by Professor Dessauer and his colleagues at the Institute fur Physikalische Grundlagen

der Medizin at the University of Frankfurt, and by Professor Yaglou at the Harvard School of Public Health, as well as by a number of other workers. There is no simple direct relation between the magnitude of the ion content of air and the reactions of people, although there are a few scattered observations which indicate that the ion content of the air exerts some influence upon human health."

"Observations were made of blood pressure; rate of respiration; as well as subjective reactions. In most cases, positive ions produced feelings of fatigue, dizziness, headaches, roaring in the ears, nausea, and the like, in a greater or lesser degree. Negative ions in most cases produced a feeling of exhilaration. There were, however, some exceptions with each sign of ion.

"The measurements of blood pressure of healthy individuals showed that after inhaling air with a high concentration of negative ions from one-half hour to one hour, the blood pressure is lowered from 5 to 15 mm. Soon after stopping the inhalation, the pressure returns to its normal value. The effect of positive ions is to increase the blood pressure slightly, but the effect is less marked. The positive ions, however, tend to produce headaches and discomfort.

"The effect of ions on the rate of respiration is shown in Fig. 5. Positive ions greatly increase the rate of respiration, while in the case of negative ions, patients breathe more quietly and there are frequent pauses in respiration. There also appears to be an increase in oxygen consumption under the influence of positive ions."

"In the case of the normal atmospheric ion content, the current to be measured is very small." (Copied from Book 36, The B. J. Palmer Chiropractic Clinic Library.)

ADDENDUM NO. 4

The following quotations are copied from "Science. A New Outline," by J. W. N. Sullivan (1935), published by Thomas Nelson & Sons, New York:

"They had tried to construct, theoretically, a great mechanical medium on the basis of their experience of ordinary matter. This seemed, at the time, a perfectly natural thing to do, but we now know that the inner processes of nature do not lend themselves to description in mechanical terms. But if we are to give up picturing nature in the terms with which we are familiar, how are we to picture it? The only possible answer at the present time is that we do not know. The workings of nature, as we have come to know them during the present century, are so unlike our ordinary experience that we cannot picture them at all. We have to be content with a more abstract, a less intimate, kind of knowledge. We can work out the laws that natural phenomena obey, but we cannot picture to ourselves anything that would behave in that manner." (Page 9.)

"All metals are conductors (of electricity) and so is water in its ordinary state. Living plants and animals, being for the most part pervaded by watery fluids, are conductors." (Page 120.)

"So far we have been speaking of electrification produced by friction. This was the only kind of electricity that had been investigated up towards the end of the eigh-

teenth century. But towards the end of that century Luigi Galvani, Professor of Anatomy at Bologna, happened to notice that a dissected frog was violently convulsed merely on being touched with a scalpel. This queer fact led him to make experiments, and he found that whenever he connected the muscles and nerves of the frog by a metal, the limbs of the frog were convulsed. In his own words: 'While I with one hand held the prepared frog by the hook fixed in its spinal marrow, so that it stood with its feet on a silver box, and with the other hand touched the lid of the box, or its sides, with any metallic body, I was surprised to see the frog become strongly convulsed every time that I applied this artifice.' Galvani believed that these effects were due to a peculiar fluid contained in the nervous system, and which passed to the muscles by the metallic connection. Electricity, in those days, was supposed to be a 'fluid,' and Galvani believed the peculiar fluid in the frog's nervous system to be the ordinary electric fluid. Another school maintained that it was a special sort of fluid, and they called it Galvanism, or Animal Electricity, a term that is still encountered amongst certain popular beliefs." (Pages 120-121.)

"Electric currents can be produced by chemical actions. Furthermore, electric currents can produce chemical effects. It was shown that an electric current could decompose water into its constituents, hydrogen and oxygen. It can also decompose solutions of metallic salts. Sir Humphrey Davy, with one of his typical flashes of insight, asserted that all chemical action was at bottom electrical." (Page 122.)

"It had been known from the middle of the eighteenth

century, for instance, that lightning could magnetize steel." (Page 124.)

"It was also known that thunderstorms have an effect upon the magnetic needle." (Page 124.)

"Oerstead showed that if a wire carrying an electric current be placed parallel to a magnetic needle, the needle is deflected. Thus a current of electricity in some way exerts a magnetic influence." (Pages 124-125.)

"We have already spoken of the lines of force of a magnet. This conception of lines of force is one of the ideas we owe to Faraday. He pictured the space around an electrified or magnetized body as being in a state of strain. At every point of the surrounding space a force, due to the body, was acting." (Page 125.)

"Another interesting result of Einstein's theory is the identification of mass and energy. We have said that the mass of a body increases with its motion. We also know that a body in motion has more energy than that body at rest. It has more energy in virtue of its motion, and the faster a body moves the greater is its energy of motion. These two facts are not unconnected. The increase in mass is, indeed, due to the increase in energy. Energy and mass, we find, are convertible terms. If we heat a body we increase its energy, and by doing so we increase its mass. A body radiating heat or light or any other form of radiant energy is losing mass. It has been experimentally demonstrated that light exerts pressure on any object on which it falls. This pressure is due to the momentum of the moving light energy. Like a water jet, a jet of light exerts pressure because it has mass. But the mass of a quantity of

energy is, relative to our ordinary standards of measurement, very small." (Page 156.)

"Heat is a form of energy, and other forms of energy can be converted into heat energy. When a falling stone strikes the ground, for instance, its energy of motion disappears at the moment of impact, but the stone and the ground immediately around it have become warmer. **The energy of motion has been changed into heat energy.** The heat caused by the sudden stoppage of a rifle bullet is sometimes sufficient to melt the bullet. **In such cases the essential thing that happens is that an orderly motion is changed into the disorderly, chaotic motion that constitutes heat.** No energy has been lost; it has been transformed. Now heat energy, as we know, **has a constant tendency to dissipate itself and to become less available for doing useful work.** Bodies at different temperatures have a tendency to reach finally one uniform level of temperature, and from bodies at the same temperature we cannot extract any useful work. A steam-engine cannot function when every part of it is at the same temperature. All the bodies in the universe have a tendency to reach the same temperature. **Heat is continually passing from hotter bodies to cooler ones.**" (Pages 181-182.)

"Chief among the elements making up the matter of living bodies are carbon, hydrogen, oxygen, and nitrogen. A dozen or more other elements are also found, but in smaller quantities. In the living body the substances formed by these elements are extremely complex, and very sensitive to external influences." (Page 188.)

(Copied from Book 35 in The B. J. Palmer Chiropractic Clinic Library.)

"Can we attribute consciousness to the amoeba? Certainly its actions are analogous to those we describe as conscious in ourselves and the higher animals. It responds to variations in light intensity, for example, by definite behaviour. It seems to have the power of voluntary movement. Also, it chooses its food. It does not devour everything indiscriminately; it takes no notice of indigestible grains of hard mineral, for instance. Our natural tendency is to interpret behaviour of this kind as being conscious behaviour. It is not impossible, nevertheless, to maintain that such behaviour is mechanical in the sense that it is the outcome purely of the laws of physics and chemistry. Mechanical models can be made which simulate, more or less, the behaviour of an amoeba. If drops of chloroform are put into a suitable liquid they will remain suspended, and, on approaching small grains of sealing-wax they will engulf them very much as an amoeba engulfs its food. Also, by taking advantage of certain chemical reactions, the phenomenon of cell-division that occurs when an amoeba reproduces itself can be, to some extent, imitated. Nobody suggests, however, that these models explain the amoeba's behaviour. The laws that explain these models certainly do not explain the amoeba. All that these models do is to make us surmise that a mechanical explanation of the amoeba is possible.

"The possibility remains very slight, however. The chemical compounds that go to form a living cell are so complex that chemists have hardly yet begun to understand them. And the arrangement of these compounds within the cell, their mutual actions and reactions, and the way they conspire to maintain the amoeba as an individual whole—all this is still a complete mystery. There are

plenty of biologists who maintain that the origin, structure, and behaviour of a living cell cannot be explained by the laws of physics and chemistry. There are other biologists who hold, as an article of faith, that a mechanical explanation of life will one day be given. So far as science has gone at present, however, a mechanical explanation of life has not been even approached." (Pages 195-196.)

ADDENDUM NO. 5

Carnegie Institution of Washington

DEPARTMENT OF RESEARCH IN TERRESTRIAL MAGNETISM

Washington, D. C.,

January 20, 1936 (No. D-1).

The number of ions in the atmosphere can be determined using special equipment known as ion-counters. This Department has in operation at Washington, D. C., two sets of counters by which we obtain continuous records of the number of ions in the atmosphere. Tests have shown that the ions in the atmosphere are not all of one type but that the majority can be placed into one of three categories when grouped according to size. The ions of smallest size (excluding almost a negligible number of electrons) are of molecular dimensions each consisting of a molecule or at most a very few molecules with an electric charge. The ions of the second group have diameters about a thousand times as great and those of the third group have dimensions between these extremes but somewhat nearer those of the molecular group. The groups are called

"small," "large," and "intermediate" ions, respectively. The large ions at Washington are usually between 1000 and 10,000 per cubic centimeter while the small and intermediate ions are each in the neighborhood of 100 to 500 per cubic centimeter. We enclose a schematic diagram of the small-ion counter, with which we record the number of small and intermediate ions, and of the large-ion counter, with which we record the number of large ions in the atmosphere.

We also record the rate at which the small ions are formed in the atmosphere; this requires quite a different apparatus. A chamber with very thin walls and which is sealed from the outside air is constructed so as to measure the rate at which ions are formed inside the chamber. Two papers from this Department are on the rate at which small ions are formed in the atmosphere; one concerns the rate of small-ion formation associated with thunderstorms and one concerns the calculated and observed rates of small-ion formation inside of an unoccupied room.

Very truly yours,

(Signed) Jno. A. Fleming.
Jno. A. Fleming,
Director.

GRW

ADDENDUM NO. 6

Although the presence of radioactive substances in precipitation has long been known throughout the radioactivity of the residue left after evaporation, the observations cited above yield an interesting insight into the prob-

lem. Undoubtedly radium emanation, escaping from the soil, is carried up into the air. There it may be dissolved in existing cloud droplets, immediately after which disintegration would take place producing radium A, B, and C; or cloud droplets may be formed on atoms of radium A, B, and C (produced in the air by the emanation) if, as is doubtful, these act as condensation nuclei. In either case, an explanation of the absence of the ionizing agent in the hurricane rain previously referred to becomes necessary. Two causes are probably operative: (a) The rain which falls in a hurricane proceeds from a layer of air which has long been out of contact with the earth's surface and consequently any short-lived radioactive matter in it has had sufficient time to decay, where as the rain from a thundercloud is falling from air which just a short time before—perhaps less than an hour—was in intimate contact with the earth's surface when the barometer was low and the emanation most likely to escape from the soil. (b) While the air which feeds moisture into a thundercloud over the land comes from the land, the rainladen air of a hurricane comes from the ocean where the radioactive content of the atmosphere has been observed to be very low.

An interesting aspect of this phenomenon is that the increase of ion formation during a thunderstorm is several fold, a condition not shown by the investigations of the residue from evaporated rain referred to previously. This invites speculation as to its significance when considered in relation to the general study of atmospheric electricity. If the increase of ion formation during a thunderstorm is a quite general phenomenon over the land, a greater air-earth electric current should occur during a thunderstorm for the same potential gradient, thus lending weight to

C. T. R. Wilson's theory that the earth's electric charge is replenished by compensating currents flowing beneath thunderclouds, and consequently to a further suggestion as to the cause of the universal-time component of the diurnal variation of the earth's electrical potential gradient in accordance with Whipple's extension of this theory.

(Copied from Book No. 47 in The B. J. Palmer Chiropractic Clinic Library, "Atmospheric Ionization Near the Ground During Thunderstorms," by G. R. Wait & A. G. McNish.)

ADDENDUM NO. 7

Increasing concern in the ion-content of the air, especially that inside of rooms occupied and unoccupied by people, has been shown in recent years on the part of those interested in problems of ventilation and health. In connection with studies of health, K. Egloff in Davos, as reported by K. Kahler, carried out investigations pertaining to the climate inside of rooms. Included with his measurements were those on condensation-nuclei content small-ion and large-ion content of air, for the most part in unoccupied rooms, but on occasions with people occupying the rooms as well. Diurnal-variation studies of the small-ion and large-ion content of the air of unoccupied rooms were made, as were also tests to determine the effects on the small-ion content of the air during occupancy of the rooms. At about the same time, Yaglou and his coworkers investigated in this country the small-ion content of air inside of unoccupied rooms and compared the diurnal variation with that for outside air-conditioning. Yaglou and asso-

ciates had made previously a study of the effects of occupancy on the small-ion content of air inside of a closed steel chamber. The results of the latter study on the small-ion content of air is affected by the presence of seven people in the closed steel chamber were not confirmed by the results of Egloff when 40 pupils occupied a closed schoolroom for several hours. The present investigation bears on this point and provides additional information not only on the effect people occupying a closed room have upon the small-ion content but upon the large-ion content as well.

Measurements were made on the small-ion and the large-ion content of the air of a room in the main laboratory of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington; it is believed these may be considered more or less representative of the general office conditions of many individuals. The entire laboratory, including the particular room used for the measurements, was occupied during the daylight working hours, but was unoccupied in general during the night hours, on Saturday afternoons, and on Sundays. Continuous records of the small-ion and the large-ion content of the air of the room were secured, thus providing data from which mean curves are drawn to represent hour-by-hour variations for the room and building occupied as well as unoccupied. Shortly afterwards, records of the same elements were secured in a room of the Administration Building of the Carnegie Institution of Washington during the annual exhibit of 1933, when large crowds of people were present in the room and building. Still later the apparatus was installed in a room of an isolated building on the grounds of the department of terrestrial magnetism, where special tests were made to ascertain in a quantitative way the extent to which

a given number of people in the room for a given length of time would affect the small-ion and the large-ion content.

(Copied from Book No. 46 in The B. J. Palmer Chiropractic Clinic Library, "Large-Ion and the Small-Ion Content of Air in Occupied Rooms," by G. R. Wait and O. W. Torreson, Washington, D. C.)

The apparatuses have been used to record ion-content of the open air for a long period as well as to record the ion-content of closed rooms.

The closed room at the Department of Terrestrial Magnetism in which the apparatus operated from November 17 to December 7, 1933, being 734 cm by 664 cm and 364 cm high, has a volume of about 179 million cc. This volume was so great that the de-ionizing action of the ion-counters on the air passing through them was not apparent in the results. During regular working hours, the room was occupied by three persons, while there generally were two persons in each of the adjoining rooms. There was occasional smoking of tobacco in the adjoining rooms and in several other rooms of the building but not in the laboratory room. **Special tests showed that tobacco smoke affected potently both the large-ion and the small-ion content.** All windows and doors were kept closed in the laboratory room to exclude such effects as far as possible. A later test was made to determine whether the effects of occupancy on the small-ion and the large-ion content were due to the presence of the three people in the room or to air-pollution coming into the room from other parts of the building; these will be discussed later.

(Copied from Book No. 46 in The B. J. Palmer Chiropractic Clinic Library, "Large-Ion and the Small-Ion Con-

tent of Air in Occupied Rooms," by G. R. Wait and O. W. Torreson, Washington, D. C.)

It will be noted that the small-ion content varied in an opposite manner to the large-ion content, both through the day and through the entire period from Monday to Sunday night. The large-ion content was in general high when the building was occupied and low when it was unoccupied. A rapid increase in the content took place almost immediately after the building became occupied and a slow decrease set in from one to several hours after the building became occupied and a slow decrease set in from one to several hours after the building was vacated. A gradual accumulation of large ions also took place from Monday morning to Saturday noon, while a slow gradual recovery, in the form of a decrease in the number of large ions, began early Saturday afternoon.

Tests were made to determine whether the changes in the ion-content of the air of the room were due to occupancy of the room or of the building. During one day the room was not occupied, except for a few minutes at 10 a. m. while attending to the apparatus. Fig. 3 gives comparisons of the diurnal variation of both the large-ion and the small-ion content, while the building but not the room was occupied and while both building and room were occupied. The two sets of curves are similar and thus indicate that the principal effects arise from the building being occupied. There is, however, a small consistent difference, the difference in each case being such that it may be attributed to effects arising from occupancy of the room by three persons. The effects from other parts of the building occurred in spite of the fact that all doors and

other openings were kept tightly closed in an effort to isolate the room from other parts of the building. The results emphasize that considerable interchange of air may take place between various parts of a building even with all doors and windows closed. Since the effect on the ions came principally from other parts of the building it was surmised that it was largely due to tobacco smoke. Tests were made to determine to what extent this surmise was correct. Conditions could not be controlled within the main building and special tests were made, therefore, after the apparatus was installed in the isolated building, where all conditions with respect to smoking, occupancy, etc., could be controlled. In this test, smoke from one pipe of tobacco and two cigarettes, during an interval of 22 min., was put into the air of the room and the small-ion and the large-ion content were recorded. The tobacco smoke produced a large increase in the large-ion content and large decrease in the small-ion content. Both the small-ion content and the large-ion content reversed direction of change soon after smoking ceased, the former gradually increasing and the latter gradually decreasing.

(Copied from Book No. 46 in The B. J. Palmer Chiropractic Clinic Library, "Large-Ion and the Small-Ion Content of Air in Occupied Rooms," by G. R. Wait and O. W. Torreson, Washington, D. C.)

The above results may be explained apparently as follows. Since the smoke particles, when electrically charged, are in effect large ions, the addition of smoke to the air of the room increased the number of large ions; these, combining with the small ions, caused the number of small ions to decrease, more or less corresponding to the increase in the number of large ions. When the smoking was stopped,

the charged smoke-particles gradually disappeared from the air, which in turn allowed the small ions to increase in number.

(Copied from Book No. 46 in The B. J. Palmer Chiropractic Clinic Library, "Large-Ion and the Small-Ion Content of Air in Occupied Rooms," by G. R. Wait and O. W. Torreson, Washington, D. C.)

Tests were made to determine if the large-ion and the small-ion content of the room was affected through a window being open. Several such tests gave consistent results; typical results are shown by the diurnal-variation graphs of Fig 5. The effect of the open window is to lower the large-ion content and to raise the small-ion content of the air. The large-ion content, therefore, approaches more nearly that for the outside air, but the small-ion content did not do so; in other words, the small-ion content in the room increased although the small-ion content of the outside air was at the time less than that for the inside air. The small-ion content inside the room is governed, not by the outside conditions, but rather by the large-ion content of the air inside the room, the changes in the small-ion content being in opposite direction to the changes in the large-ion content. The reason for this is that the average life of the small ion is only about a minute or less and sufficient circulation would not ordinarily take place to allow an appreciable number from the outside air to distribute themselves throughout the room.

The tests showed that the small-ion and the large-ion content in the closed room was noticeably affected when a current of air produced by an electric fan) was directed from a point several feet below the level of the counters

towards the intake of the apparatus. Both the small-ion and the large-ion content showed perceptible decreases when the fan was started, the decreases continuing until the fan was stopped. The effect on the large ions was greatest when the large-ion content was large. The effect, therefore, may have been due to smoke-particles accumulating towards the upper part of the room. The decrease in the small-ion content indicates that the ionization near the floor-level was less than that at other levels.

(Copied from Book No. 46 in The B. J. Palmer Chiropractic Clinic Library, "Large-Ion and the Small-Ion Content of Air in Occupied Rooms," by G. R. Wait and O. W. Torreson, Washington, D. C.)

The results of Figs. 1 and 6 show that the general effects of occupancy are similar in nature to those due to tobacco smoke, as far as the ionic-content of the air of a closed room is concerned. The effects of tobacco smoke, however, are much more potent than is the breath without tobacco smoke. The experiments indicate that the smoking of one individual may alter the large-ion content of a closed room as much as about 100 individuals not smoking. One would expect any alteration in the large-ion content of the air of the room, whether due to tobacco smoke or to other conditions, to produce an alteration in the small-ion content of the air. The results given in Fig. 6 indicate that the small-ion content of the air of an occupied closed room is affected by the presence of large ions. This same effect was noted by Yaglou, who found that the presence of seven people in a closed steel chamber caused a diminution in the small-ion content from about 250 pairs to about 50 pairs in 90 min.

(Copied from Book No. 46 in The B. J. Palmer Chiropractic Clinic Library, "Large-Ion and the Small-Ion Content of Air in Occupied Rooms," by G. R. Wait and O. W. Torreson, Washington, D. C.)

SUMMARY

(1) Continuous records of the small-ion and large-ion content of the air of a closed room made during several weeks show definite effects due to occupancy, the large-ion content undergoing an increase and the small-ion content undergoing a decrease. A few hours after vacating the room and building the large-ion content began to fall off again. A gradual accumulation of large ions occurred during the period of occupancy with a reverse effect in the small-ion content. All these effects were shown to be due principally to the presence of tobacco smoke or other contamination coming into the room from other parts of the building, even though all windows and doors were kept closed except while someone was passing to or from the room.

(2) Continuous records of the small-ion and the large-ion content of the air of a room were secured while many persons were attending an exhibit in the room and in adjacent rooms. As no smoking of tobacco occurred on three days of the exhibit, the effects noted with the ion-counters were due to causes other than to tobacco smoke. Occupancy, however, did cause an increase in the large-ion content and a decrease in the small-ion content of the air of the room. Recovery of both large-ion content and small-ion content was much more rapid after the building was vacated than when there was smoking of tobacco.

(3) Special tests after the exhibit showed that the small-ion content of the air of a closed room is appreciably decreased as a result of the room being occupied; these results are in agreement with those of Yaglou but in contradiction with those of Egloff.

(4) The special tests indicate that about 300,000,000 charged nuclei are given out in each breath. This, in conjunction with the results by Wait on the number of condensation-nuclei given out in each breath, indicate that most of the nuclei come electrically charged from the lungs.

(Copied from Book No. 46 in The B. J. Palmer Chiropractic Clinic Library, "Large-Ion and the Small-Ion Content of Air in Occupied Rooms," by G. R. Wait and O. W. Torreson, Washington, D. C.)

ADDENDUM NO. 8

Alexis Carrel in his "Man, the Unknown," discusses at length the constant and variants. We reproduce a few as they apply:

"Man is constituted, in his fourth dimension, by a series of forms following and blending into each other. He is egg, embryo, infant, adolescent, adult, mature and old man. These morphological aspects are the expression of chemical, organic, and psychological events. Most of these variations cannot be measured. When measurable, they are generally found to take place only during a certain period of the existence of the individual. But physiological duration is equivalent to our fourth dimension in its entire length. The progressive slackening of growth dur-

ing infancy and youth, the phenomena of puberty and of menopause, the diminution of basal metabolism, the whitening of the hair, etc., are the manifestations of different stages of our duration. The rate at which tissues grow also declines with age. Such growth activity may be roughly estimated in fragments of tissues extirpated from the body and cultivated in flasks. But, as far as the age of the organism itself is concerned, the information thus obtained is far from being reliable. Indeed, some tissues grow more active, others less active, at certain periods of physiological life. Each organ changes at its own rhythm, which differs from that of the body as a whole. Certain phenomena, however, express a general modification of the organism. For example, the rate of healing of a superficial wound varies in function of the age of the patient. It is well known that the progress of cicatrization can be calculated with two equations set up by Lecomte du Nouy. The first of these equations gives a coefficient, called index of cicatrization, which depends on the surface and the age of the wound. By introducing this index in a second equation, one may, from two measurements of the wound taken at an interval of several days, predict the future progress of repair. The smaller the wound and the younger the man, the greater is the index. With the help of this index, Lecomte du Nouy has discovered a constant that expresses the regenerative activity characteristic of a given age. This constant is equal to the product of the index by the square root of the surface of the wound. The curve of its variations shows that a twenty-year-old patient heals twice as quickly as a forty-year-old one. Through these equations, the physiological age of a man can be deduced from the rate of healing of a wound. From ten to about forty-five

years, the information thus obtained is very definite. But later, the variations of the index of cicatrization are so small that they lose all significance."

(Copied from pages 166-168 from Book No. 48 in The B. J. Palmer Chiropractic Clinic Library.)

ADDENDUM NO. 9

"There are no such relations. Neither the soul nor the body can be investigated separately. We observe merely a complex being, whose activities have been arbitrarily divided into physiological and mental. Of course, one will always continue to speak of the soul as an entity. Just as one speaks of the setting and the rising of the sun, altho everybody knows, since Galileo's time, that the sun is relatively immobile. The soul is the aspect of ourselves that is specific of our nature and distinguishes man from all other animals. We are not capable of defining this familiar and profoundly mysterious entity. What is thought, that strange being, which lives in the depths of ourselves without consuming a measurable quantity of chemical energy? Is it related to the known forms of energy? Could it be a constituent of our universe, ignored by the physicists, but infinitely more important than light? The mind is hidden within the living matter, completely neglected by physiologists and economists, almost unnoticed by physicians. And yet it is the most colossal power of this world. Is it produced by the cerebral cells, like insulin by the pancreas and bile by the liver? From what substances is it elaborated? Does it come from a preexisting element, as glucose from glycogen, or fibrin from fibrinogen? Does it consist

of a kind of energy differing from that studied by physics, expressing itself by other laws, and generated by the cells of the cerebral cortex? Or should it be considered as an immaterial being, located outside space and time, outside the dimensions of the cosmic universe, and inserting itself by an unknown procedure into our brain, which would be the indispensable condition of its manifestations and the determining agent of its characteristics?

"At all times, and in all countries, great philosophers have devoted their lives to the investigation of these problems. They have not found their solution. We cannot refrain from asking the same questions. But those questions will remain unanswered until new methods for penetrating more deeply into consciousness are discovered. Meanwhile, we feel the urge to know, and not merely to speculate or to dream. If our understanding of this essential, specific aspect of the human being is to progress, we must make a careful study of the phenomena attainable by our present methods of observation, and of their relations with physiological activities. We must also have the courage to explore those regions of the self whose horizons, on every side, are shrouded in dense mist."

(Pages 118-119, "Man, the Unknown," by Alexis Carrel. Book No. 48 in The B. J. Palmer Chiropractic Clinic Library.)

ADDENDUM NO. 10

"Whatever our sufferings, our joys, and the agitation of the world may be, our organs do not modify their inward rhythm to any great extent. The chemical exchanges of

the cells and the humors continue imperturbably. The blood pulsates in the arteries and flows at an almost constant speed in the innumerable capillaries of the tissues. There is an impressive difference between the regularity of the phenomena taking place within our body and the extreme variability of our environment. Our organic states are very steady. But this stability is not equivalent to a condition of rest, or equilibrium. It is due, on the contrary, to the unceasing activity of the entire organism. To maintain the constancy of the blood's composition and the regularity of its circulation, an immense number of physiological processes are required. The tranquility of the tissues is assured by the converging efforts of all the functional systems. And the more irregular and violent our life, the greater are these efforts. For the brutality of our relations with the cosmic world must never trouble the peace of the cells and humors of our inner world."

(Pages 192-193," "Man, the Unknown," by Alexis Carrel. Book No. 48 in The B. J. Palmer Chiropractic Clinic Library.)

ADDENDUM NO. 11

It will be difficult to get rid of a doctrine which, during more than three hundred years, has dominated the intelligence of the civilized. The majority of men of science believe in the reality of the Universals, the exclusive right to existence of the quantitative; the supremacy of matter, the separation of the mind from the body, and the subordinated position of the mind. They will not easily give up this faith. For such a change would shake pedagogy, medi-

cine, hygiene, psychology, and sociology to their foundations. The little garden which each scientist easily cultivates would be turned into a forest, which would have to be cleared. If scientific civilization should leave the road that it has followed since the Renaissance and return to the naive observation of the concrete, strange events would immediately take place. Matter would lose its supremacy. Mental activities would become as important as physiological ones. The study of moral, esthetic, and religious functions would appear as indispensable as that of mathematics, physics, and chemistry. The present methods of education would seem absurd. Schools and universities would be obliged to modify their programs. Hygienists would be asked why they concern themselves exclusively with the prevention of organic disease, and not with that of mental and nervous disturbances. Why they pay no attention to spiritual health. Why they segregate people ill with infections, and not those who propagate intellectual and moral maladies. Why the habits responsible for organic diseases are considered dangerous, and not those which bring on corruption, criminality, and insanity. The public would refuse to be attended by physicians knowing nothing but a small part of the body. Specialists would have to learn general medicine, or work as units of a group under the direction of a general practitioner. Pathologists would be induced to study the lesions of the humors as well as those of the organs. To take into account the influence of the mental upon the tissues, and vice versa. Economists would realize that human beings think, feel, and suffer, that they should be given other things than work, food, and leisure, and that they have spiritual as well as physiological needs. And also that the causes of economic and financial crises

may be moral and intellectual. We should no longer be obliged to accept the barbarous conditions of life in great cities, the tyranny of factory and office, the sacrifice of moral dignity to economic interest, of mind to money, as benefactions conferred upon us by modern civilization. We should reject mechanical inventions that hinder human development. Economics would no longer appear as the ultimate reason of everything. It is obvious that the liberation of man from the materialistic creed would transform most of the aspects of our existence. Therefore, modern society will oppose with all its might this progress in our conceptions.

(Pages 280-281, "Man, the Unknown," by Alexis Carrel. Book No. 48 in The B. J. Palmer Chiropractic Clinic Library.)

ADDENDUM NO. 12

"The value of time, or chronaxy, must be identical in the contiguous neurons, or in the neuron and the muscular fiber. The propagation of nervous influx does not take place between two neurons having different time standards. Thus, a muscle and its nerve must be isochronic. If the chronaxy of the nerve of the muscle be modified by a poison, such as curare or strychnine, the influx no longer reaches the muscle. Paralysis occurs, although the muscle is normal. These temporal relations of nerve and muscle are as indispensable to normal function as is their spatial continuity. We do not yet know what takes place within the nerves during pain or voluntary motion. But we are aware that a variation of electric potential travels along

the nerve during its activity. In fact, Adrian has shown, in isolated fibrils, the progress of negative waves, whose arrival in the brain is expressed by a sensation of pain."

(Pages 94-95, "Man, the Unknown," by Alexis Carrel.)

"The sound body lives in silence. We do not hear, we do not feel, its working. The rhythms of our existence are expressed by cenesthetic impressions which, like the soft whirring of a sixteen-cylinder motor, fill the depths of our consciousness when we are in silence and meditation. The harmony of organic functions gives a feeling of peace. When an organ begins to deteriorate, this peace may be disturbed. Pain is a signal of distress. Many people, although they are not ill, are not in good health. Perhaps the quality of some of their tissues is defective. The secretions of such gland, or such mucosa, may be insufficient or too abundant. The excitability of their nervous system, exaggerated. Their organic functions, not exactly correlated in space or in time. Or their tissues, not as capable of resisting infections as they should be. Such individuals feel profoundly these organic deficiencies, which bring them much misery. The future discoverer of a method for inducing tissues and organs to develop harmoniously will be a greater benefactor of humanity than Pasteur himself. For he will present man with the most precious of all gifts, with an almost divine offering, the aptitude for happiness."

(Pages 110-111, "Man, the Unknown," by Alexis Carrel.)

(Copied from Book No. 48 in The B. J. Palmer Chiropractic Clinic Library.)

ADDENDUM NO. 13

"The effect of the chemical compounds contained in food upon physiological and mental activities is far from being thoroughly known. Medical opinion on this point is of little value, for no experiments of sufficient duration have been made upon human beings to ascertain the influence of a given diet. There is no doubt that consciousness is affected by the quantity and the quality of the food. Those who have to dare, dominate, and create should not be fed like manual workers, or like contemplative monks who, in the solitude of monasteries, endeavor to repress in their inner self the turmoil of the secular passions. We have to discover what food is suitable for human beings vegetating in offices and factories. What chemical substances could give intelligence, courage, and alertness to the inhabitants of the new city. The race will certainly not be improved merely by supplying children and adolescents with a great abundance of milk, cream, and all known vitamins. It would be most useful to search for new compounds which, instead of uselessly increasing the size and weight of the skeleton and of the muscles, would bring about nervous strength and mental agility. Perhaps some day a scientist will discover how to manufacture great men from ordinary children, in the same manner that bees transform a common larva into a queen by the special food which they know how to prepare. But it is probable that no chemical agent alone is capable of greatly improving the individual. We must assume that the superiority of any organic and mental form is due to a combination of hereditary and developmental conditions. And that, during de-

velopment, chemical factors are not to be separated from psychological and functional factors."

(Pages 304-305, "Man, the Unknown," by Alexis Carrel. Copied from Book No. 48 in The B. J. Palmer Chiropractic Clinic Library.)

ADDENDUM NO. 14

"Microbes and viruses are to be found everywhere, in the air, in water, in our food. They are always present at the surface of the skin, and of the digestive and respiratory mucosas. Nevertheless, in many people they remain inoffensive. Among human beings, some are subject to diseases, and others are immune. Such a state of resistance is due to the individual constitution of the tissues and the humors, which oppose the penetration of pathogenic agents or destroy them when they have invaded our body. This is natural immunity. This form of immunity may preserve certain individuals from almost any disease. It is one of the most precious qualities for which man could wish. We are still ignorant of its nature. It appears to depend on some properties of ancestral origin, as well as on others acquired in the course of development. Certain families are observed to be susceptible to tuberculosis, appendicitis, cancer, or mental disorders. Others resist all diseases except the degenerative ones occurring during old age. But natural immunity does not exclusively derive from our ancestral constitution. It may come also from the mode of life and alimentation, as Reid Hunt showed long ago. Some diets were found to increase the susceptibility of mice to experimental typhoid fever. The frequency of pneumonia may also be modified by food. The mice belonging to one of the strains kept in the mousery of the Rockefeller Insti-

tute died of pneumonia in the proportion of fifty-two per cent while subjected to the standard diet. Several groups of these animals were given different diets. The mortality from pneumonia fell to thirty-two per cent, fourteen per cent, and even zero, according to the food. We should ascertain whether natural resistance to infections could be conferred on man by definite conditions of life. Injections of specific vaccine or serum for each disease, repeated medical examinations of the whole population, construction of gigantic hospitals, are expensive and not very effective means of preventing diseases and of developing a nation's health. Good health should be natural. Such innate resistance gives the individual a strength, a boldness, which he does not possess when his survival depends on physicians."

(Pages 206-207, "Man the Unknown," by Alexis Carrel.)

"However, it would have been impossible to build up a science of medicine merely by compiling a great number of individual observations. The facts had to be classified and simplified with the aid of abstractions. In this way disease was born. And medical treatises could be written. A kind of science was built up, roughly descriptive, rudimentary, imperfect, but convenient, indefinitely perfectible and easy to teach. Unfortunately, we have been content with this result. We did not understand that treatises describing pathological entities contain only a part of the knowledge indispensable to those who attend the sick. Medical knowledge should go beyond the science of diseases. The physician must clearly distinguish the sick human being described in his books from the concrete pa-

tient whom he has to treat, who must not only be studied, but, above all, relieved, encouraged, and cured. His role is to discover the characteristics of the sick man's individuality, his resistance to pathogenic factors, his sensibility to pain, the value of his organic activities, his past and his future. The outcome of an illness in a given individual has to be predicted, not by a calculation of the probabilities, but by a precise analysis of the organic, humoral, and psychological personality of this individual. In fact, medicine, when confining itself to the study of diseases, amputates a part of its own body.

"Many physicians still persist in pursuing abstractions exclusively. Some, however, believe that a knowledge of the patient is as important as that of the disease. The former desire to remain in the realm of symbols. The latter feel the necessity of apprehending the concrete. Today the old quarrel of the realists and the nominalists is being revived around the schools of medicine. Scientific medicine, installed in its palaces, defends, as did the church of the Middle Ages, the reality of the Universals. It anathematizes the nominalists who, following the example of Abelard, consider Universals and disease as creations of our mind, and the patient as the only reality. In fact, a physician has to be both realist and nominalist. He must study the individual as well as the disease. The distrust which the public feels toward medicine, the inefficiency, and sometimes the ridicule, of therapeutics, are, perhaps, due to the confusion of the symbols indispensable to the building up of medical sciences with the concrete patient who has to be treated and relieved. The physician's lack of success comes from his living in an imaginary world. Instead of his patients, he sees the diseases described in

the treatises of medicine. He is a victim of the belief in the reality of Universals. Moreover, he mixes the concepts of principle and method, of science and technology. He does not realize sufficiently that the individual is a whole, that adaptive functions extend to all organic systems, and that anatomical divisions are artificial. The separation of the body into parts has so far been to his advantage. But it is dangerous and costly for the patient, and ultimately for the physician."

(Pages 247-48-49, "Man, the Unknown," by Alexis Carrel.)

"There are, as we know, two kinds of health, natural and artificial. Scientific medicine has given to man artificial health, and protection against most infectious diseases. It is a marvelous gift. But man is not content with health that is only lack of malady and depends on special diets, chemicals, endocrine products, vitamins, periodic medical examinations, and the expensive attention of hospitals, doctors, and nurses. He wants natural health, which comes from resistance to infectious and degenerative diseases, from equilibrium of the nervous system. He must be constructed so as to live without thinking about his health. Medicine will achieve its greatest triumph when it discovers the means of rendering the body and the mind naturally immune to diseases, fatigue, and fear. In remaking modern human beings we must endeavor to give them the freedom and the happiness engendered by the perfect soundness of organic and mental activities.

"This conception of natural health will meet with strong opposition because it disturbs our habits of thought. The present trend of medicine is toward artificial health,

toward a kind of directed physiology. Its ideal is to intervene in the work of tissues and organs with the help of pure chemicals, to stimulate or replace deficient functions, to increase the resistance of the organism to infection, to accelerate the reaction of the humors and the organs to pathogenic agencies, etc. We still consider a human being to be a poorly constructed machine, whose parts must be constantly reenforced or repaired. In a recent address, Henry Dale has celebrated with great candor the triumphs of chemical therapeutics during the last forty years, the discovery of antitoxic sera and bacterial products, hormones, insulin, adrenalin, thyroxin, etc., of organic compounds of arsenic, vitamins, substances controlling sexual functions, of a number of new compounds synthesized in the laboratory for the relief of pain or the stimulation of some flagging natural activity. And the advent of the gigantic industrial laboratories where these substances are manufactured. There is no doubt that those achievements of chemistry and physiology are extremely important, that they throw much light on the hidden mechanisms of the body. But should they be hailed as great triumphs of humanity in its striving toward health? This is far from being certain. Physiology cannot be compared with economics. Organic, humoral, and mental processes are infinitely more complex than economic and sociological phenomena. While directed economics may ultimately be a success, directed physiology is a failure and will probably remain so.

“Artificial health does not suffice for human happiness. Medical examinations, medical care, are troublesome and often ineffectual. Drugs and hospitals are expensive. Men and women are constantly in need of small repairs,

although they appear to be in good health. They are not well and strong enough to play their part of human beings fully. The growing dissatisfaction of the public with the medical profession is, in some measure, due to the existence of this evil. Medicine cannot give to man the kind of health he needs without taking into consideration his true nature. We have learned that organs, humors, and mind are one, that they are the result of hereditary tendencies, of the conditions of development, of the chemical, physical, physiological, and mental factors of the environment. That health depends on a definite chemical and structural constitution of each part and on certain properties of the whole. We must help this whole to perform its functions efficiently rather than intervene ourselves in the work of each organ. Some individuals are immune to infections and degenerative diseases, and to the decay of senescence. We have to learn their secret. It is the knowledge of the inner mechanisms responsible for such endurance that we must acquire. The possession of natural health would enormously increase the happiness of man.

“The marvelous success of hygiene in the fight against infectious diseases and great epidemics allows biological research to turn its attention partly from bacteria and viruses to physiological and mental processes. Medicine, instead of being content with masking organic lesions, must endeavor to prevent their occurrence, or to cure them. For instance, insulin brings about the disappearance of the symptoms of diabetes. But it does not cure the disease. Diabetes can be mastered only by the discovery of its causes and of the means of bringing about the repair of the replacement of the degenerated pancreatic cells. It is obvious that the mere administration to the sick of the

chemicals which they need is not sufficient. The organs must be rendered capable of normally manufacturing these chemicals within the body. But the knowledge of the mechanisms responsible for the soundness of glands is far more profound than that of the products of these glands. We have so far followed the easiest road. We now have to switch to rough ground and enter uncharted countries. The hope of humanity lies in the prevention of degenerative and mental diseases, not in the mere care of their symptoms. The progress of medicine will not come from the construction of larger and better hospitals, of larger and better factories for pharmaceutical products. It depends entirely on imagination, on observation of the sick, on meditation and experimentation in the silence of the laboratory. And, finally, on the unveiling, beyond the proscenium of chemical structures, of the organismal and mental mysteries."

(Pages 311-12-13-14, "Man, the Unknown," by Alexis Carrel.)

(Copied from Book No. 48 in The B. J. Palmer Chiropractic Clinic Library.)

ADDENDUM NO. 15

Measurement of the Impedance of the Human Body.

By changing merely the last two letters, the word physician becomes physicist. Actually, even this small change is unnecessary because the physician secures the greater part of his data regarding the condition of a patient through observations on various physical quantities. Among the many properties which may have diagnostic

significance, those of an electrical character have not been generally considered. They have, however, received occasional attention since Galvani in 1791 first demonstrated that living matter exhibits electrical phenomena.

The first serious attempt to correlate the electrical properties of a human body with its pathological condition was made in 1881 by the French scientist, Vigoreaux. He reported that there was a relation between the electrical resistance of the body and the degree of thyroid activity. Measurements of d-c resistance were, however, difficult owing to polarization at the electrode surfaces and no practical use was made of Vigoreaux's findings. Following the introduction of alternating-current technique into electrochemical measurements, Gildermeister, in Germany, repeated Vigoreaux's investigations, using alternating current. This avoided the difficulty of electro-polarization as such. It was found, however, that there was an appreciable reactance component in the measured impedance. * * *

In an attempt to check Dr. Brazier's conclusions, an extensive investigation was carried out jointly by the Massachusetts Institute of Technology and the Massachusetts General Hospital. The first result of major importance was the discovery that there was a marked difference in behavior between internal and external tissues. * * *

Using this device, to which the name "impedance comparator" has been given, extensive measurements have been made of a wide variety of pathological cases. Extensive measurements have been made also of the variations occurring in a single individual. The results may be generalized briefly as follows:

Every person in normal health has a value of Q for

the internal tissue which is characteristic of him as an individual. Any abnormal pathological condition will act to change this value, and changes of the order of 2 to 1 have been observed. For individuals in normal health Q lies between 0.10 and 0.07. The pathological spread is from 0.02 to 0.14. In a single individual, Q may vary as much as 10% depending on the preceding history with respect to fatigue.

These studies have indicated that there are physiological differences between internal and external tissues as well as electrical differences, and it is believed that they should be measured separately in any study of the correlation between electrical impedance and pathological condition. For such measurements the comparator described above has been found to be both accurate and convenient."
—J. W. Horton.

(Copied from pages 1-4, "The General Radio Experimenter," Vol. X, No. 9, February, 1936, Published by General Radio Company, Cambridge A, Mass.)

ADDENDUM NO. 16

"If we were justified in our further assumption that the electric potential within the cells is maintained by oxidation, then variations in oxidation must accompany variations in activity and these variations in oxidation would be manifested by variations in temperature. This assumption was supported by experimental research. * * * Our findings then were critically examined and correlated in the hope of being able to propose a theory which would bridge the gap between the living and the non-living and

suggest a physical line of ascent from the atom to man. The physical constants of temperature, electric conductivity, electric capacity and electric potential could all be estimated during life, that is, during the operation of the causes of excitation, depression, and death, thereby making it possible to glimpse the transformation of biology and medicine into exact sciences. * * *

"We know that the oxidation must be initiated and controlled by electric energy, for electric stimulation initiates and controls oxidation. A nerve current may be regarded as an electric current. But a nerve current—an electric current—causes no oxidation of any carbon compound outside the organism. It may be argued, however, that at the point of impact, the nerve current may be converted into heat of sufficient intensity to cause oxidation of the carbon compound. * * *

"As already stated in Chapter I, we made studies of long wave radiation, that is, studies of the heat changes in the brains and livers of warm-blooded animals and determined the variations under many conditions. We measured the temperature of the brains of animals in shock, during and after hemorrhage, under the influence of anesthetics and narcotics, after the excision of the thyroid and adrenal glands and of the liver, in depression and death from insomnia; and we found that these variations in temperature bore a direct relation to the structure and stainability of the cells and to the increase and decrease in the energy and function of the brain.

It was apparent that the variations in that form of radiant energy which we call heat followed closely the variations in electric conductivity, electric capacity and electric

potential observed under like conditions, thus indicating the fundamental nature of these electric and radiant forces.

* * * It would seem as if a more correct measurement of the activity of protoplasm would be by measuring the entire spectrum of the protoplasm because, since most wavelengths are finally eliminated as heat, the long heat waves do not tell the whole story of organic activity. For example, consciousness would be associated with a certain percentage of short wave radiation. Yet the patient who is unconscious and exhibits a great loss in short wave radiation may emit an excess of long heat waves, that is to say, the patient may have a high temperature and yet be unconscious. * * * Regarding this point, one could argue with equal logic that because everywhere in the world, oil and gasoline and wood are being burned, since oxidation and heat are common phenomena, serving any or no purpose, then in the case of organic oxidation, the combustion is a mere by-product and has no relation to the pull of the load. One might with equal logic say that the burning of the coal in the fire box and the by-product, steam, have no relation to the work of the locomotive, or that although an electric battery exhibits electricity, the electricity is a by-product because almost all matter exhibits electrical phenomena, and indeed is electrical in nature; or that because sunshine is everywhere and has always existed, or because water is everywhere, even where plants and animal life do not exist, sunshine and rainfall have no relation to the existence and growth of protoplasm.

"The choice lies between accounting for the phenomena of protoplasm by the application of the laws of physics and chemistry, or accounting for these phenomena as being due to causes unknown.

On the basis of the foregoing considerations, one would expect to find that when an organ is so impaired by disease or injury that it can no longer perform its function, the loss of function must be due to a corresponding decrease of the short wave radiation. An interesting experiment indicates the validity of this assumption. When the organs of the body are oxidized by the method described in Chapter 26, visible light is produced, the radiations varying from the short infra-red to the ultraviolet. If the muscles, the kidneys, the liver, and the heart are performing their functions within the normal range, while the function of the brain is so depressed that the conscious state is lost, one would expect to find that the radiations generated by the oxidation of muscles, the liver, the kidneys, the heart would be within the normal range, while very little or no light would be produced by the oxidation of the brain. We found that this expectation was realized in the case of a human being who died after five days of unconsciousness, due to age and acute disease, while all of the other organs functioned normally. * * *

“The helpless, passive state of the muscles of the body showed that the electric potential of the brain had fallen to near the zero point, hence the muscles did not receive from the brain along the nerves the radio-electric action current which fires the nerve end-plates of the muscles—an essential factor in the maintenance of muscle tone and the performance of muscular action.” (Pages 37, 38, 58, 78, 81, 82, and 83.)

“The kinetic system converts latent energy into motion or heat in response to adequate stimuli.” (Page 199.)

Variations in functional activity indicate variations in oxidation; variations in oxidation are manifested by variations in heat production. If heat is a constant product of functional activity, then, if we could measure the progressive changes in the temperature of the various tissues and organs during the various phases of excitation and exhaustion under conditions identical with those formerly studied, we not only should be able to check our findings in the previous researches but should be able finally to link those findings with the clinical evidence.

As the first means to this end we decided to use the method of measurement employed by physicists for the measurement of minute temperature variations, that is, to employ thermocouples so constructed that they could be applied to the brain, liver, muscle, or other tissue of the living animal. These experiments were carried out with the collaboration of Amy Rowland, S. W. Wallace and Lillian Jacobson.

"This method of measuring variations in the temperature of living tissues was first utilized, as far as we have been able to discover, by Becquerel and Breschet in 1835, when they used thermocouples to determine variations in temperature in different parts of the body in different pathological conditions. They inserted thermocouples into various muscles of the arm, the thigh and the leg, into the abdomen and into different portions of tumorous growths. They even inserted the couples into the auricles of the heart to determine the difference between the temperature of arterial and venous blood. Their reasons for undertaking this research are significant. In their *Premier Memoire sur la Chaleur Animale*, they state in brief that this research was suggested as the result of certain other

attempts to answer the following questions: 'Are the vital forces of an electrical or chemical nature? Has the organism its own peculiar mode of action?'

"'Is the stimulation of the nerves of sensation necessarily transmitted to the cerebral hemispheres, or is the direct transmission of the stimulation in the normal animal arrested at the spine or in the pons Varroli? Furthermore, is the transmission to the brain in accordance with the fundamental laws governing transmission along the nerves? Is the formation of a perception in the brain accompanied by phenomena which the means of investigation at our command will not permit us to regard as subject to the general laws of material movement?'

"In Schiff's research thermocouples were employed which were applied directly to exposed nerves or inserted into different parts of the brain. The author felt that he had established the following points:

1. That the irritation of the nerve increased its temperature.
* * * * *
3. That every peripheral irritation gave a response in the brain manifested by increased temperature.
* * * * *
7. That not only tactile sensation but stimulation of all the organs of special sense produced an increase in the temperature of the cerebrum.
* * * * *
9. That psychic excitation, independent of the sensations which produced it, was accompanied by a production of heat in the nerve centers, which was

quantitatively greater than the heat engendered by less complex sensations.

The author believed that his observations definitely excluded the possibility that the temperature changes noted were due to circulatory changes; and that his experiments were sufficient 'to establish, with all the desirable precision, that the production of heat which we have observed is really the result of excitation which is peculiar to and an intrinsic part of the nerve elements.'" (Pages 243-244-245.)

"The researches of Lillie, Loeb, Osterhout, Mathews, McClendon, Hill, Lucas and of many other biophysicists and biochemists indicate that the functions of the cells of living organisms are related to electrical processes; that the living cell, whether it exists alone or as an element in a complex organism, possesses a certain store of potential energy which is manifested by variations in polarity and by action currents; that variations in the permeability of the living cell in response to the electrically charged elements of the fluid which surrounds it parallel variations in irritability in response to stimulation; that factors which suspend or abolish irritability also suspend or abolish alterations in permeability.

"Every activity of living tissue is accompanied by electric currents; and many activities are also initiated by electric currents. In fact, the work of the investigators referred to above shows how strong is the tendency to consider that vital processes are associated with electric energy.

"In view of this trend of physiological conceptions, the electrical properties of living protoplasm become of vital interest. As this interest extends, the need of definite

quantitative data increases. The laws which govern the action of electrical forces in inorganic systems are known exactly. It is possible to calculate exactly how much heat, or what chemical change, or how much work will result from the passage of a current of known strength through a known resistance during a definite period of time." (Pages 216-217.)

"In 1912 A. V. Hill utilized the thermo-electric method in an investigation to determine the presence or absence of temperature changes during the transmission of a nervous impulse." (Page 246.)

"An attempt was made to establish our assumption that the changes in the temperature of the brain after the injection of adrenalin may be justly ascribed to variations in oxidation. Preliminary experiments have shown that after the injection of adrenalin the temperature of the venous blood coming from the brain was increased to above that of the arterial blood to the brain. This finding, if confirmed, will be a strong indication that the temperature changes within the brain cannot be entirely, if at all, due to variations in the blood supply to the brain. (Pages 253-54.)

(Copied from "The Phenomena of Life," by George Crile. Book No. 53, The B. J. Palmer Chiropractic Clinic Library.)

ADDENDUM NO. 17

P. 23. "The constant factor, however, was always a loss of energy."

P. 38. "The physical constants of temperature, electric conductivity, electric capacity," etc.

P. 47. "Properly to understand the application of physical constants to the human mechanism," etc.

P. 89. "The three physical constants, the electric conductivity, electric capacity," etc.

P. 91. "From the foregoing it is evident that the gross, * * * of every living thing may be identified by physical constants."

P. 106. "Under excitation of the brain, these constants increase; in depressed states of vitality, these constants suffer a decline; at death these constants reach the level of non-living material."

P. 199. "We have already described the effects of fear and of physical injury upon the organism in terms of physical constants and radiation."

P. 207. "Neither the energy nor the matter that forms the rainbow, nor the energy and that matter that forms the living state, is constant. It is only the pattern that is constant."

P. 217. "Is the range of conductivity the same for all types of tissue, and in each tissue does it remain constant under all conditions?"

P. 243. "If heat is a constant product of functional activity, ——"

P. 364. "It would then be clear to the physicist what factors have maintained a constancy of the protoplasm—."

P. 365. "It explains the universal presence in proto-

plasm of water which has the highest dielectric constant, the greatest specific heat, is the greatest solvent."

(Copied from Book No. 53, "The Phenomena of Life. Geo. Crile, in The B. J. Palmer Chiropractic Clinic Library.)

ADDENDUM NO. 18

BRAIN TELLS ITS SECRETS

Scientists Listen to Sounds That Go With Thought!
Minds Wired to Loudspeaker

By Edward Gottlieb

New York, March 5.—(U. S.)—With the brain of a man in deep hypnotic sleep "wired" to a loud speaker and a recording mechanism, scientists studied the purring and thundering of human "gray matter" and today revealed new secrets of the hypnosis phenomena.

In similar experiments with the blind they found that the lack of sight made no apparent difference in the electrical workings of the brain. * * *

The Experiment

These were some of the conclusions reached in a report of a series of amazing experiments conducted by Dr. Alfred L. Loomis, Dr. E. Newton Harvey and Dr. Garret Hobart at the Loomis Laboratory in Tuxedo Park, N. Y. It was published today in Science.

Through two long pins stuck beneath the scalps of their owners, the brain's minute electrical waves were detected, recorded and then amplified a millionfold so that they might be heard as well as seen.

Many of the strange sounds and waves still await explanation, the scientists indicated.

Interested in comparing hypnosis with sleep, the doctors imported a subject from McGill University in Montreal. He was first tested awake and during normal sleep and showed characteristically every normal brain wave. Then, Hypnotism.

After he was hypnotized the subject stiffened and was tested in his rigid state. His brain, the experimenters said, remained awake at all times in spite of his sustained hypnotic fit.

From this Dr. Loomis concluded that there is no such thing as hypnotic "sleep." The hypnotized subject's brain waves, he said, showed no characteristics or normal sleep.

It was possible, however, to induce a state of hypnotic blindness in the subject, the report said. The subject's eyelids were fastened open with adhesive tape and he was hypnotized. The report added:

"Alternately, every fifteen seconds he was told that he could see, and that he was blind. In every case waves characteristic of one who is blind, were heard and appeared when the suggestion was made that he was blind, and in every case they ceased when he was told that he could see."

28 Persons Tested.

Twenty-eight different persons were studied and in each there were certain sounds or waves which appeared regularly. There were many whose brain activity could

only be measured in emotional bursts of electricity, according to the report. * * *

This method of experimentation was begun two years ago in the hope of studying at first hand the effects of epilepsy and other similar diseases. It has since developed to such a point that scientists at a dozen universities are deep in study of the brain's electricity, confident that it is the key to many of the mysteries of thought, dreams, and living substance.

(Chicago Herald and Examiner, Friday, March 6, 1936.)

ADDENDUM NO. 19

"Depression and death follow asphyxia, hemorrhage, excessive cold, protracted insomnia, excessive doses of anesthetics, narcotics, or cyanides. The extent of the depression produced by each of these can be estimated accurately by measurement of the electric potential. Electricity is the energy that drives the organism. The electric potential is an important factor in the distribution of electric energy in protoplasm. The symptoms of excitation, depression and death are the external manifestation of the changes in the electric potential of the organism." Page 167.

"We shall also interpret in terms of electric potential the results of physical injury, infection, stimulants, asphyxia, anesthetics, narcotics, and hemorrhage. In other words, we shall test in the clinic the science of radio-electric pathology." Page 168.

"In the inaugural phase of muscular exertion, physical injury, emotion and infection of such severity as finally to cause depression and possibly death, oxidation, radiation and electric potential are all increased. Eventually, however, the factors of safety are used up and the stage of depression ensues.

"Especially in hemorrhage and asphyxia, this primary increase in oxidation, radiant and electric potential is due to the anaerobic oxidation induced by adrenalin, the output of which is increased to meet a biologic emergency." (Page 184.)

"What then is an anesthetic? It is an agent that is capable of interfering with the genesis of bio-electric currents and the short wave radiation required for normal activity. A local anesthetic interferes with the short wave radiation in the part into which it is injected. Spinal anesthesia and splanchnic anesthesia interfere with the short wave radiation from the affected nerves, which means their power of generating and transmitting nerve impulses to the respective organs and tissues." (Pages 191-192.)

"Narcotic and poisons also affect every organ and tissue, reducing the potential and electric conductivity, usually within safe limits when the agent is a narcotic but to zero—the death point, when the agent is a poison.

"The same is true of stimulants in so far as the effect upon the whole organism is concerned, but the first effect of a stimulant is to increase the stainability of the cells of the brain, to increase electric potential, electric capacity and electric conductivity, to increase the percentage of radia-

tion in the short wave field, thus increasing the radiant and electric energy of the whole body. This increased energy, however, is followed by a depression which is marked by decreased electric conductivity, potential and capacity and decreased differential stainability of the brain cells, the amount of the resultant decrease bearing a direct relation to the degree of the primary increase in electric and radiant energy. That is, stimulation is followed by depression." (Pages 193-194.)

"Later we learned that the exhaustion of the kinetic system is expressed also by decreased electric conductivity, electric potential and electric capacity, and recently we have found that in the state of lowered potential, the genesis of short wave radiations and of bio-electric currents is decreased.

"The fundamental principles of the shockless operation may be stated as follows: Every adequate stimulus, with or without inhalation anesthesia, whether from trauma or emotion, activates the brain-thyroid-adrenal-sympathetic system. That is, the sight of the operating room, the spoken word implying danger, the taking of the anesthetic, the instrumental injury of tissues in the course of the operation and the traction of stitches after the operation all are adequate stimuli. As the result of this stimulation of the brain-thyroid-adrenal-sympathetic system, the electric potential falls and the emission of radiations in the short wave field are correspondingly diminished. Obviously the only way of preventing this result is by the development of a technique which will exclude from the brain the stimuli of the special senses and the stimuli of common sensation.

The inhalation anesthetic in itself and narcotics, as we have shown, decrease the electric potential and the percentage of short wave radiation. There exists no single agent that is entirely harmless in itself and can produce anoci-association which is the goal of operative surgery." (Page 200.)

"7. Exhaustion from any cause—surgical shock, insomnia, emotion, fright, infection, etc.—is marked by a diminished conductivity of the brain and an increased conductivity of the liver." (Page 224.)

"8. The immediate effect of activation appears to be an increased conductivity of the brain, tending later to decrease as the stage of exhaustion approaches. This has been shown to be an immediate effect of physical injury; an early effect of the injection of diphtheria toxin; an immediate effect of the injection of adrenalin." (Page 225.)

"9. Thyroid feeding in large doses over a prolonged period produces the typical symptoms of hyperthyroidism with ultimate exhaustion, accompanied by the changes in the conductivity of the brain typical of exhaustion from any other cause; i. e., the conductivity of the cerebrum and the cerebellum is decreased." (Pages 225-226.)

"15. A limited series of observations of the influence of various agents, which produce marked clinical effects, indicate that the progress of alteration in function produced by any agent is coincident with changes in electrical conductivity." (Page 228.)

"From these findings it would appear that the intracellular changes in exhaustion and shock which are revealed by the microscope are paralleled by alterations in electric conductivity, and that both the histologic and the electric

changes bear a direct relation to the vitality of the organ. (Page 229.)

"3. The injection of adrenalin produced an increase in the conductivity and capacity of the brain and spinal cord and in the medulla of the adrenal glands, and a decrease in the conductivity and capacity of the liver, kidney, spleen, thyroid gland, cortex of the adrenal glands and of voluntary muscle. (Page 232.)

"1. Influences which affect the general physical condition of the organism produce changes in electric conductivity in the dominating reactive tissues, —." (Page 238.)

"5. These studies indicate that electrical conductivity measurements provide a means whereby to further the interpretation of the normal operation of the organism, and whereby to measure the progress of pathological processes within the various organs and tissues.

"6. From our findings to date, it would appear that the intracellular changes in exhaustion and shock which are revealed by the microscope are paralleled by alterations in electric conductivity, and that both the histological and the electric changes bear a direct relation to the vitality of the organ." (Page 239.)

"We demonstrated that the cause of William Lyndman's death was an excessive physical stimulation of the sensory nerves."

"That is to say, the impulses that finally killed William Lyndman passed over the nerve pathways to the brain and thence were broadcast throughout the body, activating the

identical mechanism used in struggle or in the emotions so excessively that complete exhaustion resulted." (Page 357.)

"But even these findings gave us no understanding as to the source and nature of the energy which was present in life and was lost in death.

"We then tested the variations in the vitality of organs by excluding from them the circulation of the blood." (Page 358.)

"The primary cause of death from shock was not to be found in the circulation, in the respiration, or in the blood. Our experiments in which the blood supply of organs and tissues was excluded proved that the excitation, depression and death due to physical injury, emotional excitation, toxins, etc., was not due to failure of the kidneys, the stomach and intestines, the pancreas, the spleen, the thyroid gland, the muscles, the tendons, the connective tissue, the bones or the joints." (Pages 358-359.)

"In this consideration of the Radio-Electric conception as an explanation of living phenomena our physicist would find that although it can not be proven, since protoplasm has not been generated in the laboratory, it nevertheless harmonizes many phenomena of the living state. It offers many parallels and analogies between the living state and non-living phenomena. It has suggested a solution of certain problems pertaining to the normal and the pathological states of living organisms. The radio-electric conception explains our failure to show that the loss of the energy of the living state in surgical shock was not due primarily to

failure of the circulation or of respiration or to changes in the chemistry of the blood."

"It explains the presence in living organisms of electric potential and of electric currents. It shows the necessity of continuous oxidation for the maintenance of radiant and electric properties. It shows the reason why the electric conductivity, capacity and potential vary with the speed of function and the rate of growth." (Pages 364-365.)

"It is obvious that the role played by radiation and electricity in living processes is no more mystical than that played by radiation and electricity in man-made mechanisms. Electricity brought over a single feed wire may light an electric lamp, operate a dynamo or turn an electric drill. Radiation may operate a radio or a robot, the final manifestation of the electric power or of the radiation depending upon the receiving instrument. So in living processes the final manifestation depends upon the end organ or the receiving mechanism. The effect on the receiving mechanism in an ameba would differ from that in a lion; the effect if the thyroid gland received the electric current or radiation would vary from that if the pancreas received it. Like the receiving mechanisms made by man, each produces its specific response." (Pages 367-368.)

(Copied from "The Phenomena of Life," by George Crile Book No. 53, The B. J. Palmer Chiropractic Clinic Library.)

ADDENDUM NO. 20

"Exhaustion may follow emotional as well as physical stress since the expression of the emotions involves an in-

creased activity of the energy system, that is, of the nervous system and of the thyroid-adrenal-sympathetic complex. The sole means by which the thyroid-adrenal-sympathetic system can affect the energy system is by increased oxidation; and increased oxidation increases radiation, and increased radiation increases electric potential, thereby charging up the entire mechanism and effecting the preparation for a muscular attack or defense or escape. Under emotional stress, however, the gears for that part of the brain and the muscles that execute the muscular attack or escape by running are not set for action. It follows that all of the organs and processes not needed in the preparation for the muscular attack, defense or escape, such as those which function in digestion and procreation, are inhibited. In other words, the discharge of energy from the stimulated action patterns are not expressed in muscular action; therefore, emotion—fear and anxiety—holds the final common path. All of this results in a depression of the radiant and electric forces that govern the organism. As an analogy one may consider what would happen to a motor car standing still with its engine running at top speed and the clutch released.” (Pages 185-186.)

* * * *

“In accordance with this conception, worry is interrupted stimulation. Worry is a state of alternation between hope and fear. It is an alternating stimulation and depression of oxidation, radiation, and electric potential. It is slow fading out of the molecular furnaces, or radiogens, within protoplasm.” (Page 189.)

“When a patient is too cold, the activity of the protoplasm of every cell of his body is decreased ten per cent for each degree centigrade of loss of body temperature.

When a patient has a fever, for each degree centigrade of rise in temperature there is a rise of ten per cent in the activity of every cell of the body.

"When an individual is subjected to physical injury, to exertion, to infection, to emotion, all his protoplasm is affected." (Page 190.)

(Copied from "The Phenomena of Life," by George Crile, Book No. 53 in The B. J. Palmer Chiropractic Clinic Library.)

ADDENDUM NO. 21

"Pioneers in an amazing new field of research recently traveled to the Loomis Laboratories, Tuxedo Park, New York, for the first meeting of its kind in America. The sixty scientists who compared notes are 'brain-wave' experts, students of minute, telltale pulsations of electric current that come from the billions of cells in the human brain.

With supersensitive electricity-recording instruments, able to register less than a millionth of a volt of current, they are discovering curious facts about our brains and how they work. Already, these scientists have achieved such exciting feats as 'photographing a dream,' watching the electrical pattern made by brain cells in solving a mathematical problem, and witnessing an 'electrical storm,' piling up in the brain of an epileptic. By discovering rhythms in the varying strengths of these tiny currents, they are working toward a radically new technique in detecting and diagnosing various ailments of the brain.

"The first man to tap this feeble flow of power was

the German scientist, Fleischle von Marxow. In 1890, with crude and relatively insensitive apparatus, he detected faint electrical impulses passing through the skulls of animals.

"For generations before, physiologists had known that tiny currents of electricity accompany the functioning of many parts of the body. If you wink your eye, clench your jaws, take a deep breath—each action produced its minute flow of electricity. Time after time, laboratory tests have revealed the connection between electricity and animal life.

"When the Nobel Prize winner, Dr. E. D. Adrian, of Cambridge University, England, connected the nerve of a cat's foot to an amplifying set and a galvanometer, an instrument which determines the intensity of an electric current, he found that electricity flowed along the nerve every time he flexed the animal's toe. At Princeton University, the American scientists E. G. Wever and C. W. Bray, performed an even more spectacular test. Disconnecting the auditory nerve of a rabbit from the brain, they attached it by means of electrodes to vacuum tubes and a telephone. Words spoken into the rabbit's ear could be heard over the telephone, proving that ears literally are microphones, turning sound oscillations into electrical impulses. In another laboratory, scientists discovered that the beating heart of an embryo chicken, barely formed within its shell, gave off sufficient current to influence a sensitive galvanometer.

"But, most striking of all is the record of a moving mirror in an English apparatus. The heart of a frog was removed and connected to a reflecting galvanometer in which electrical impulses tilted a tiny mirror to deflect a beam of light. Even after all visible signs of life had left the organ, regular pulsations of electric current continued

to swing the mirror of the instrument. Hour after hour, in the stillness of the darkened room, the spot of light reflected on the wall maintained its weird and silent oscillations, recording the electric beating of a heart apparently dead!

"By registering the changes in electric current produced by the human heart on a graph called an electrocardiogram, specialists now diagnose heart ailments. Variations in the curves on these graphs indicate the sources of trouble and aid in prescribing treatment.

"For decades after Von Marxow's discovery of brain waves, research in this field awaited new and better equipment. The development of the radio brought it. Vacuum tubes, able to amplify feeble electrical impulses hundreds of thousands of times, make present-day experiments possible.

"In 1929, Hans Berger, at the University of Jena, Germany, began the first extensive series of brain-wave investigations. It was the work of this pioneer that led science into a fertile field of research. He carried on his tests under a wide variety of conditions, with subjects hot and cold, relaxed and excited, asleep and under anesthetics. In operating rooms, he placed his electrodes directly on the brain thru openings in the skull. He tested scholars and feeble-minded children and, in one experiment, he watched fluctuations in current as a person, deprived of air, lapsed into unconsciousness.

"In the United States, such scientists as Hallowell Davis, E. L. Garceau, and A. J. Derbyshire of Harvard, Leonard Carmichael and H. H. Jasper of Brown University, Al-

fred L. Loomis and Garret Hobart of the Loomis Laboratories, E. Newton Harvery of Princeton, and Louis W. Max, of New York University, have pushed ahead with further researches.

"Recently, I spent an afternoon watching Dr. Max at work. Imagine yourself behind the scenes in his basement brain-wave laboratory. Assistants are busy checking batteries, warming electrodes, loading the recording camera. Sometimes, it takes as long as two hours to warm up and adjust the delicate instruments and get everything in readiness for a test.

"The subject takes his place on a special cot in a screened-off portion of the laboratory. One arm is carefully scrubbed with soap and water, then washed with alcohol, and finally rubbed with ether to remove all skin oils. Then, strips of cloth, saturated with a salt solution, are wound about the arm to keep the electrodes pressed against the skin at the wrist and on the forearm. A white turban, suggesting a nightcap, contains the silver head electrodes and keeps them in contact with the scalp.

"At present, Dr. Max is carrying on a fascinating series of experiments in connection with deaf-mutes. He has discovered that they literally 'think with their hands.' That is, electrical activity in the brain is paralleled by similar activity in the hands, even when the latter fail to show the slightest movement. In subjects having the faculty of speech, this is not true. Instead, they appear to have parallel electrical activity in brain and tongue. This brings up a startling question: Do we think with our brains or with our whole bodies? It is this line of research Dr. Max is now

pursuing, and his electrical records indicate that we really think with our whole bodies!

"During one of his early experiments, a curious succession of electrical impulses began coming through his instruments. Puzzled, he clipped earphones into the circuit and discovered he was picking up a short-wave broadcast! The horizontal body of the subject was acting as the antenna. Now, subjects are shielded by a coffin-like framework, covered with copper screen, which is placed over them on the cot.

"When two assistants have finished lowering this framework into place, the lights snap off. You follow Dr. Max into the dimly lighted instrument room beyond the partition. The faint impulses being picked up by the electrodes run through shielded cables into great, boxed-in amplifiers at the far end of the instrument chamber. There, just as your radio amplifies tiny waves caught by the antenna, rows of vacuum tubes magnify the minute electrical impulses coming from the brain and arm of the subject so that they will actuate recording apparatus.

"The impulses then flow on into two Einthoven oscillographs, super-sensitive galvanometers with gold-plated quartz filaments less than a thousandth of an inch thick. These filaments are suspended in magnetic fields produced by two giant, horse-shoe-shaped electromagnets. The amplified electrical impulses coming from the brain and arm of the subject flow through the fine quartz threads and cause them to vibrate according to the strength of the current.

"It is the shadows of these vibrating strings cast by

powerful projection lamps that write the records of the varying electric currents on the film of the recording camera: Just now, the shutter of the camera is closed and the two fine, dark lines pulsate back and forth on a ruled observing screen. The camera, behind the screen, can be set in action in an instant to make a permanent record of any portion of the test.

"For nearly twenty minutes, the dark lines vibrate in erratic fashion. Then the brain line settles into a steady rhythmic fluctuation. The subject is asleep. Slumber is usually chosen for tests because then the brain and body conditions are most constant.

"On more than a score of occasions, Dr. Max has recorded dreams on his strips of films. In one, the subject imagined himself at Coney Island and in another he was engaged in a fist fight at a barbecue. These wavy lines form the world's first picture of a dream. And they shed light on a long-debated question in psychology: How long does a dream last?

"This work interested me particularly because of an experience I had some years ago. I dreamed of wrestling with a burglar in a dark kitchen and knocking a tin pan from a hook in the course of the struggle. I awoke with the sound of a pan striking the floor reverberating in my ears. A friend of mine, a Harvard psychologist, later told me that I had dreamed the whole struggle in a flash, during the instant I was waking up after hearing the pan accidentally fall from the hook. Dreams, psychologists then agreed, were compressed into a second or two of time. Now, Dr. Max's records of electrical activity in the brain

indicate that dreams may last for two and a half minutes or more.

"There are several reasons, Dr. Max explains. In the first place, the form and rhythm of pulsations from muscles and from the brain are noticeably different to the eye of the expert. Furthermore, when Berger, the German experimenter, placed his electrodes directly on the brain in an operating room, he got stronger currents than when they were on the outside of the skull. This would not have been so if the current came from anywhere except the brain itself.

"During his researches, Berger also discovered that brain waves fall into two general groups, the alpha rhythm, with approximately ten fluctuations a second, and the beta rhythm, with twenty or more a second. The character of these electrical pulsations remains about the same for a given subject day after day. Eventually, the German scientist hopes to discover the normal wave, just as heart specialists have done in the case of the electrocardiogram, thus enabling him to diagnose brain ills electrically.

"Along this line, research men at Harvard have found that epilepsy can be detected through the abnormal brain waves given off by the afflicted person. Seizures, their tests indicate, are nerve storms which result in a great piling up of electrical charges. During an epileptic fit, the flow of electricity from the brain increases 3,000 per cent over that given off when the brain is relaxed and normal.

"When a person faints, on the other hand, brain waves slow down to from three to five a second. But, the voltage rises to more than double the normal level.

"In Dr. Max's laboratory, it has been discovered that the harder the brain works the more electricity is recorded from the arms of his deaf-mute subjects. He has found that doing a difficult mathematical problem will produce more of this body current than doing an easy one and that memorizing a sentence results in a greater output of electrical impulses than simply reading it.

"So far, the tests show that the more intelligent you are, the less body current you generate during thinking. Also, they show that when you are chilly, the voltage is greater than when you are comfortably warm.

"At points of special interest during the test, Dr. Max opens the shutter of his recording camera and the shadows of the pulsating quartz filaments leave their permanent zig-zag record on the sensitive film. By studying hundreds of such records, the scientist hopes to find the solution to another physiological riddle: How deep is a deep sleep? From his researches, he expects to discover some electrical yardstick by means of which he can measure the degrees of slumber.

"There are probably less than half a dozen similar laboratories in the country. At the Loomis Laboratories, Tuxedo Park, N. Y., you see the most elaborate scientific equipment of all for the study of these mysterious currents. There, instead of a recording camera and vibrating quartz filaments you find a great horizontal drum, eight feet long and forty-four inches in circumference, capable of holding a continuous, eight-hour record.

"In the room where the subject sleeps, a sensitive microphone picks up each sound and a photo-electric, or

light-sensitive, cell records every movement on the bed. Amplified current, coming from the electrodes held in place against the sleeper's scalp, actuates twin high-speed, siphon recorders, hollow pens with a continuous flow of ink, which trace their wavy lines a fifth of an inch apart on paper attached to the revolving drum.

"One line is in red ink, the other is green. The red line shows each heartbeat, each respiration, each movement of the subject on the bed, while the green line records the fluctuation of electric current from the brain. The two pens advance along the drum at the rate of one foot an hour. Three ratchet devices sum up the heartbeats, the respirations, and the bed movements every time the drum completes a revolution, marking the rate per minute on the paper. As the drum is driven by a constant-speed motor and acts as its own clock, electric contacts enable the scientists to send a given stimulus to a sleeper at regular intervals and to note the effect on the currents from the brain.

"The finished graph produced by this method is a sheet forty-four inches wide and eight feet long. To simplify studying the huge record-sheet, Dr. Loomis and his associates view it first through a red glass, so that only the green lines are visible, and then through a green glass, so only the red lines show.

"From such study of these scientific hieroglyphics, Dr. Loomis believes he has discovered six types of brain waves, each recognizable through the spiked or balled character of the sharply zigzagging lines. During certain hours of the night, he reports, there are mysterious bursts of electrical activity in the brain. These bursts appear in trains and last from five to twelve seconds.

"One curious thing observed at Tuxedo Park is that steady snoring has no effect upon the electric current flowing from the brain, but an isolated snore, apparently startling the sleeper, starts a train of increased pulsations. Many sounds, such as the distant slamming of a door, will cause increased electrical activity in the brain cells when a person is asleep but will not do so when he is awake.

"Little by little, laboratory explorers are feeling their way into this new realm of science. The researches carried on thus far, fascinating as they have proved, merely scratch the surface of the possibilities ahead."

(Copied from "Amazing Electrical Tests Show What Happens When You Think," by Edwin Teale, Popular Science Monthly, May, 1936.)

ADDENDUM NO. 22

"If you think that you can tell a lie and get away with it, test your cleverness against this homemade model of a lie detector or polygraph, as it is often called. With uncanny accuracy it uncovers falsehoods as quickly as you can tell them. While your voice is saying 'no,' your body says 'yes' and leaves a visible record of the truth on this device.

"Much amusement can be had by subjecting friends to different tests. For example, have some one choose one playing card from a dozen. Pass them one at a time before the eyes of the person undergoing the test and when he sees the selected card he may say 'no,' but the indicator of the lie detector will jump and tell that he is fibbing. Although

your friend may give no visible indication of this, the sight of the card he chose will instantly cause an increase in his blood pressure, and this is recorded by the instrument. After some one has hidden an object in another part of the house, unknown to you, name the different rooms to him and watch the lie detector. After you have discovered the correct room, it is easy to narrow down the location to the exact spot in which the object is hidden."

(Copied from "Two Simple Ways to Make a Lie Detector," by Kenneth Murray, Popular Science Monthly, May, 1936.)

ADDENDUM NO. 23

Brain-Body Connection Found Powered by "Living Dynamos"

Prof. E. J. Cohn of Harvard Discovers Giant Molecules
Generating Electric Currents That Transmit "Messages"
on Nerve Fibers—Ten-Year Research to Be Told to
Chemists' Session

By William L. Laurence

Kansas City, Mo., April 12.—The discovery of the existence in the living body of a vast network of hitherto unsuspected power systems, which supply brain, nerve and muscle with the electrical current involved in the translation of messages between mind and body, was reported here today by Professor Edwin J. Cohn of the Harvard Medical School on the eve of the opening of the ninety-first meeting of the American Chemical Society.

These "living dynamos" are the giant molecules which compose the proteins, chief constituent of the protoplasm, the most important building block of living matter. Similar "electric plants" have been found in the lipoids, constituents of nerve tissue, and in amino acids, which are protein components.

The Harvard research, carried on over a period of ten years, has determined that these molecules, some of them from 34,000 to 5,000,000 times larger than the hydrogen atom, are in reality like magnets, carrying a positive charge on one end and a negative one on the other.

While the opposite charges make the molecules neutral, they nevertheless have been found to exert a profound effect in the generation of the small electrical currents which are believed to be intermediaries between the realms of mind and matter, somehow linking the material and the immaterial, the tangible and the intangible.

* * *

Dr. Cohn and his associates reported having measured for the first time the electrical forces associated with the giant molecules as well as having determined their sizes and shapes.

These electrical forces, it was stated, are of primary importance in the transmission of nervous impulses and their discovery removes a barrier to the understanding of how a nerve message courses down a nerve fiber.

* * *

Something not yet known causes the positive end to lose its charge. The negative charge on the other end im-

mediately moves toward the positive end of the adjoining molecule. Thus a current moves along the entire chain, and is discharged in a muscular contraction.

In other words, an electric current has been found to travel down a nerve fiber in this fashion.

A negative charge from an adjoining cell comes in contact with the positive end of a dipolar ion and discharges. The dipolar ion's negative end then loses its charge of the positive end of the next dipolar ion in the chain.

This takes place all along the line of the molecules that compose the nerve. The molecules line up and discharge, then line up and discharge again.

The way in which these electric forces are initiated is still a life-process mystery. Nor is it known what happens when an impulse reaches its destination; that is why a muscle contracts when the electrical impulse from the nerve fiber reaches it.

In other words, science is still very far from knowing how a thought in the brain can start electrical impulses traveling down the nerves and becomes translated into bodily action.

One possible hypothesis, however, is offered. It is that when the nerve impulse, coming from the brain and borne along the nerves by the electric charge, gets to the muscle and discharges, the molecules in the muscle change shape and so the muscle contracts.

ANALYSIS OF ELECTRICAL CHANGES

Dr. Cohn's findings, it was stated by some of the authorities present, represent a beginning in the understanding of how such behavior can happen, how muscles move, how nerve impulses discharge, and the manner in which mind and body, material and immaterial, somehow manage to translate their activities in each other's terms.

"The contraction of muscles, the secretion of glands and the conduction of nervous impulses are all associated with electrical changes," Dr. Cohn stated.

"The passage of electricity along the nerve has occasionally been compared to that along a telegraph wire, the conducting tissue being composed, like the other organs of the body, of proteins and lipoids, acids and bases, salts and water. * * *."

(From "The New York Times," Monday, April 13, 1936.)

ADDENDUM NO. 24

The Truth and Nothing But the Truth;
Test for Lie Detector at B. J.'s Clinic
Shows Value in Crime Detection Work

The truth, the whole truth and nothing but the truth.

That's the story of the Keeler Polygraph, better known as the lie detector. In reality it is a truth detector because it ferrets out the truth and if properly operated and under the proper circumstances it cannot fail. The truth will out in spite of any efforts to conceal it.

Davenport has such a truth detector. It was invented by a Prof. Keeler of Northwestern University and there are but four in operation outside of the university and no more are being sold. The

one in Davenport is located at the Palmer School of Chiropractic and is used by Dr. B. J. Palmer in his clinic. Here it is a part of the elaborate equipment at the clinic and it is used there to record respiration and pulse of some of Dr. Palmer's patients.

Although evidence of the lie detector has not yet been generally accepted by the courts, in criminal cases, and there have been no actual convictions solely on evidence produced through the lie detector it already has proved its value in crime detection work. Proponents of the lie detector claim that in another few years there will be no question as to its accuracy. The lie detector's record will be generally accepted by every court the same as finger print evidence is today. In the beginning, they point out, finger print evidence was regarded as skeptical and was not accepted in court. Today finger prints are conclusive anywhere.

The theory behind the lie detector is that the "conscience mind" cannot lie. The educated mind may tell many untruths but not the conscience. And it is the conscience which the lie detector records through the respiration and the heart beats and it can be easily determined whether the truth is being told.

WAVE PROOF BOOTH

At Dr. Palmer's clinic efforts have been made to make the lie detector even more efficient than at the Northwestern University where it was invented. At the latter place it is used in an ordinary sized room. Because of the sensitiveness of the instrument Dr. Palmer believes that the instrument cannot be as effective under these circumstances. In every room there are radio waves, there are electrical waves from the light wires, there are the magnetic waves which flow from the North pole to the South pole and other disturbances in the atmosphere. Unless steps are taken to eliminate these it is the belief of Dr. Palmer that the lie detector cannot prove its true worth and cannot be absolutely accurate.

These disturbances have been overcome, however, at the Palmer clinic with the construction of a unique booth in which the lie detector is placed. The booth is completely lined with a copper screen which keeps out the radio waves and the electric waves. A sheeting of iron covers part of the top and part of the sides of the booth to prevent the magnetic waves from entering and all light wires are grounded. This makes the booth absolutely wave proof. A radio is dead within the booth and a compass will spin like a top.

In addition to these precautions the machine itself is grounded, the operators are grounded, the table on which the patient or suspect lies is grounded and the patient or suspect is also grounded

by a contrivance which he grasps in one hand while lying on the table. In this matter, according to Dr. Palmer, there is not the slightest possible chance of any outside interferences bungling the job of the polygraph.

SMALL INSTRUMENT

The lie detector itself is a small simple looking box-like instrument which rests on a table. On one end are three needles with inked points which record the vibrations on a roll of paper which moves slowly from one roller to another. The patient or suspect lies flat on his back with a contrivance around the chest to record respiration. Around each arm are strapped bands of cloth such as are used to take blood pressure for that is exactly what the machine records. The patient or suspect relaxes and the questioning begins.

First he is asked a series of simple questions such as the time of day, where he is, his name, day of the week and similar ones to which he answers truthfully. Then he is asked another series to which he is asked to deliberately lie. For instance he is asked: "Does the moon shine in the day time?" The subject answers "yes." Thus his reactions to the truth and to a lie are recorded. This record having been made he is then questioned about the crime of which he is suspected. These questions may be mixed in with ordinary questions and after the experiment the record on the roll is carefully checked as his reaction to each question has been carefully recorded.

DEMONSTRATION IS GIVEN

At a demonstration before a group of tri-city peace officers, court officials, prosecutors and newspapermen Dr. Palmer demonstrated the workings of the machine. A Rock Island police officer first volunteered as a subject. His reactions both to the simple questions and to those to which he was asked to deliberately lie were recorded it showed a difference in each case.

Deputy Sheriff Walter Korn appeared with a prisoner. He had been taken from the Scott county jail where he was serving a term for mooching.

"Gimme a cigaret," he said to a newspaperman as he entered the room.

"We don't need a lie detector to find out what he is," said the news writer as the subject took four cigarets from the proffered package.

A Moline policeman recognized the prisoner.

"I know that bird," he said. "We've had him in lots of times. If he reacts to anything but a sock on the nose I'll eat my shirt."

By this time the subject had been placed under the detector and Mr. Palmer was starting the questioning. He was asked the ordinary questions first. Then started the series to which he was asked to deliberately lie.

"Does an apple tree grow onions?" Dr. Palmer asked. The subject replied it did not. He was again asked to deliberately lie.

"Just act natural like you do when I question you," a Davenport policeman said.

The subject winced. "I can't," he began, and the needle on the machine jiggled.

"Cut it" said the officer. "Be yourself" and the questioning continued.

The lie series of questioning ended Dr. Palmer, who had the prisoner's lengthy police record before him started to question him about it. In many cities he had been arrested for mooching, petty thievery and various crimes. He had served from five days to six months all over the country.

"When better jails are built he'll be in them," said Assistant County Attorney John McSwiggin.

The prisoner could not deny his record and the needle aside from recording that he was extremely nervous didn't waver much. But then came the question which proved the value of the detector.

NEEDLE NOSE DIVES

"Did you ever commit a crime for which you weren't caught and convicted?" Dr. Palmer asked.

"No," said the subject and immediately the needle did a nose dive. It went so far from the line that all who were watching gave a start. It told the story more clearly than anything else. The lie detector had done its job.

Dr. Palmer predicts that it won't be many years before they will be in use generally. In the meantime the Keeler Polygraph at the Palmer clinic is at the disposal of the police departments of the tri-cities and vicinity if they want to use it. Officers are welcome at any time to bring their prisoners to the clinic and submit

them to the test. That they will accept B. J.'s offer was evident by the expressions which were heard following the demonstration. And who knows but what the next big crime in this locality may be solved by the lie detector at the Palmer school.—The Daily Times, Davenport, Iowa, June 1, 1936.

ADDENDUM No. 25

The following quotations taken from *light and work*, by M. Luckiesh, Director, Lighting Research Laboratory, National Lamp Works of General Electric Company:

"The receptors in the human eye have been adapted to certain wave-lengths of radiation, to certain intensities of illumination, and, and to various other factors which are discussed in these chapters." Page 4.

* * *

"Its overwhelming and universal importance indicates that light is one of the few materials from which the mechanism of the universe is composed and energized." Page 5,

* * *

"The eye cannot function best under a low intensity of illumination when it has been developed for serious activity under the great intensities outdoors. Continued vision is not likely to be as satisfactory or free from fatigue and harmful results under conditions radically different from the general conditions outdoors." Page 7.

"Nature's way is the safe way * * *."

"Throughout the ages during which man knew nothing of the laws of the physical world * * *." "His crude learning was a matter of experience. * * * As far as

the human race is concerned, experimental research has just begun and the job to be done is of great magnitude. * * * Naturally we know more of physical phenomena than of the physiological and psychological phase of life. This is particularly true of light and of radiation in general. * * * Practice lags behind knowledge." Page 8.

* * *

"Solar radiation consists of radiant energy of many wave-lengths. * * * The eye is sensitive to only a certain range of these wavelengths. * * * This radiant energy is really electro-magnetic radiation differing only in wavelength from that used in wireless telegraphy or 'radio'. The eye responds to only a certain narrow range of wavelengths just as the 'radio' receiving station. * * * Beginning with the shortest wavelength of radiation to which the eye is 'tuned', the result is a sensation of violet. * * * If a normal eye receives all these radiations at the same time and in the same relative amounts emitted by the sun (as seen at noon on a clear day) the resulting sensation is a combination of all the possible individual ones. This resultant sensation is approximately white." Page 9.

* * *

"We cannot expect our visual organs and physiological processes to reconcile themselves in a day or a year or a century to radical changes * * *."

"Fortunately, the human being is fortified with a certain resistance to harmful conditions. The human body is constantly repairing damages. The mental process of man is adaptive and can ignore unnatural conditions to some extent. But is not the best environment that which would permit most of the energy required for repairs to be utilized in material and mental output?" Page 16.

"The eye endures much abuse without complaining directly, but all these abuses of inadequate and improper lighting are recorded eventually on the loss side of the human ledger. We cannot, without risk, subject our sense-organs and mental being to conditions radically different from those for which they have become tuned." Page 19.

* * *

"Incidentally, the smallest object that can be seen is that whose image falls upon only one retinal receptor. This limits the resolving power of the eye if nothing else does. Normal eyes cannot readily resolve two objects nearer together than about 40 seconds of visual angle, which corresponds to a separation of about 0.0025 inch at a distance of 14 inches from the eye." Page 134.

* * *

"* * * we have the pupil of the eye as a governor to some degree. It performs the same function as the iris diaphragm in the camera for it regulates the average brightness * * *." It should be noted that the size of the aperture determines to some extent the definition of the image." Page 135.

* * *

"* * * distraction is minimized * * * the observer has nothing else to do at the time." Page 142.

* * *

"We see now that the eye even under the ideal conditions of the laboratory does not begin to operate anywhere near its maximum effectiveness in this respect until the illumination of the test-object is above 10 foot-candles." Page 149.

"A sensation of brightness or of color does not grow immediately to its full or final value the instant the image is focused on the retina, and it does not immediately decrease to zero when the stimulus disappears." Page 166.

* * *

"After-images are evidence that sensations do not decay to zero immediately upon the cessation of the stimulus. * * * Incidentally, the persistence of vision is the basis of motion-pictures." Page 168.

* * *

"They jump from point to point, pausing in steady fixation usually from two to seven times across the ordinary four or five-inch line. During these jumps the eyes cannot possibly see clearly any more than they could see rapidly moving print * * *. Clear vision not only takes place when the eyes are stationary, but visual acuity is marked only at the point of the retina intersected by the optical axis of the eye." Page 188.

* * *

"It was to be expected that the variegated images continually falling in succession upon the retina in the course of everyday vision constituted a confusion to some degree at least, interfering with the seeing of any particular pattern of the series. These interfering after-images are not only visual but are also mental to some extent." Page 195.

* * *

"At the proper intensity of illumination the letter at the widest part of the slot will be clearly distinguished while the letter exposed the shortest time will not be distinguishable." Page 197.

ADDENDUM NO. 26

The following quotations taken from "Seeing and Human Welfare," by Matthew Luckiesh, D.Sc., Director, Lighting Research Laboratory, General Electric Company:

"Eyes are our most complex and useful sense-organ. The visual sense is our most complex and useful sensory process. Seeing is our most universal and valuable controllable activity. Seeing is nearly as complex as living and it is responsible for most of our experiences and, therefore, knowledge; and for most of our usefulness and, therefore happiness. * * * The very commonplaceness of seeing renders it at once highly important and generally ignored." Page 2.

* * *

"Seeing is a complexity consisting of the external world of physical objects and factors and the intricate internal world of psycho-physiological effects. * * * The end-products of seeing are human efficiency, behavior and welfare. Much of the energy which we expend between arising and bedtime is used in the process of seeing. Much of the air we breathe and the food we eat is expended in seeing without any apparent physical work. Much of the fatigue in this half-seeing world of civilized beings is due to seeing." Pages 2-3.

* * *

"Eventually, the marvelous eyes of human beings were the result of the environment and of the need of human beings. They utilized the one element—light—which could travel quickly from objects at a distance. They are radio receiving-sets which respond to radiant energy of a certain

range of wavelengths or frequencies emitted by the sun. They are selective to the wavelengths of energy which are most abundant in sunlight. * * * Nerve activity brings the message to the braincenters and a chain of happenings results in perception of an object at a distance. * * * Why do we see the object out in space where it is, instead of in the eye where the image of the object is? The answer is that this is an acquired accomplishment." Page 6.

* * *

"No other phase of seeing so emphasizes the complexity of this activity and establishes the importance of the psychological aspects as the perception of objects apparently where they are in the external world." Page 7.

* * *

"There is still another angle to this abnormal convergence of eyes over long periods daily. Convergence is not the natural state of rest for the eyes and concentration of attention is not the natural state of rest for the human seeing-machine or the mind." Page 14.

* * *

"As the distance is lessened, the unnaturalness or strain of convergence rapidly increases. Therefore, when normal eyes are obliged to look at objects less than a foot away for long periods, unnecessary strain is experienced, which results in a waste of human resources." Page 16.

* * *

"Need one wonder why eyes are defective and other human resources are drained?"

"Of course, eyes are important; but they are tools. The human being is the seeing-machine and seeing in-

volves the external factors and psycho-physiological effects as well as the visual tools." Page 18.

* * *

"The prevalent assumption that when things can be seen the seeing is satisfactory must be shattered, for this is not true."

"Often great improvements result from simple expedients and any person can do much to help himself to conserve his resources if he develops a seeing-consciousness." Page 19.

* * *

"The science of seeing reveals the fallacy of momentary appraisals of seeing. It is concerned with the accumulative effects of seeing throughout the period of work. It has shown that the waste in energy and other human resources decreases as seeing is improved." (Under illustration opposite page 21.)

* * *

"Seeing has already been defined as a complex function and a complete activity of a human being instead of being merely the performance of eyes as visual tools. Seeing is much more than vision, because it is the complete operation of a human seeing-machine. It has been given little attention as an activity which consumes human resources, * * *." Page 22.

* * *

"The human seeing-machine is human. Cameras are seeing-machines; and, after a fashion, photo-electric cells are. But a human seeing-machine experiences feelings, enthusiasm, depression, nervous tension muscular strain,

digestive disturbances, headaches and many other psychological and physiological effects." Page 23.

* * *

"Let us take the case of driving an automobile on a busy street. As the driver is approaching a cross-street, a traffic sign is waiting to warn or command him, but apparently he ignores it. The traffic-officer perhaps said to the driver, 'Can't you see the sign?' Of course, the sign is now visible to the officer and the driver, both of whom have nothing to do for the moment but look at it. But the conditions were quite different for the driver before he stopped the automobile. At best, only a brief moment was devoted to it as his eyes swept the intersection. Much of his capacity for seeing was utilized by other objects. * * * Some of his sense capacity and attention was being used in operating the automobile, * * *. Through his ears various sounds commandeered some of his sense capacity; and some attention was given to listening for warning sounds from the side-street. Subtracting all these, and more, one finds that very little of his attention and sense capacity was available for seeing the traffic-sign. Besides, only a brief period of time was available." Page 24.

* * *

"Most visual work is done under distraction of some kind. Where manual and visual work are combined, only a part of the attention and sense capacity is available for seeing. Therefore, any improvement which makes seeing easier and quicker, increases certainty and conserves human resources. To the severity of unnatural visual tasks and the inadequate and often unnatural conditions of lighting, which civilization has imposed upon human seeing-machines, we may now add the distractions that are

so common and their demands upon attention and sense capacity." Page 25.

* * *

"The determination of the best conditions for the human seeing-machine requires the development of new methods and technique and the measurement of psychophysiological effects, such as fatigue, nervous tension, muscular strain and other complex effects." Page 32.

* * *

"* * * the most outstanding success so far has been made in measuring nervous muscular tension."

"In driving an automobile along a country highway at a moderate speed one relaxes and is not particularly conscious of nervous or muscular tension. But when one enters a city where traffic is dense one sits up straighter and grips the wheel more tightly. Seeing has now become more important on account of the numerous hazards and more difficult owing to the variety of demands upon attention and sense capacity." Pages 34-35.

* * *

"He tires as much from nervous muscular tension as from physical effort." Page 35.

* * *

"Of course, one can scarcely be alert and working at high speed without exhibiting such tension, but unnecessary waste is useless work and it can be lessened by improving seeing." Page 36.

* * *

"The nervous muscular tension was measured at the tips of the index and middle fingers of the left-hand which rested upon a large button connected with a hidden deli-

cate instrument. This automatically recorded the pressure unconsciously exerted by the fingers." Pages 36-37.

* * *

"Certainly nervous muscular tension, which is a very important effect of human activity, has not been definitely related to seeing until recently." Page 41.

* * *

"Little is known about anything until it has been subjected to measurements."

"Knowledge progresses not only in proportion to the quantity, but also to the quality of knowledge." Page 44.

* * *

"Any science is an array of facts, tested and testable; and therefore incontestable within the limits of accuracy of the measurements which established them. * * * Measurements are expressed in terms of the physical world into facts and laws, because that is the ultimate and universal basis upon which everything, including the universe, rests. * * * Human beings cannot understand themselves until the sciences involved have been fully developed. Therefore, we find ourselves with incomplete knowledge of important phases of the human beings, even though physical science has already gone far toward fathoming the mysteries of atoms and stars." Page 45.

* * *

"The physical light or radiant energy is changed at the retina into another form of energy.

"The receptor process is that which converts the light or radiant energy into something which stimulates the nerve-endings." Page 48.

"The process which takes place in the retina apparently is photo-chemical." Page 49.

* * *

"In fact, binocular vision requires much of the mind." Page 61.

SEEING IS DECEIVING

"There are as many deceptions as there are visual situations, for it may be said that we never see anything exactly as it is appraised by physical instruments." Pages 63-64.

* * *

"And motion introduces a vast variety of unrealities, because it takes time for visual sensations to rise and to fall."

"* * * imaginings * * * prejudice our senses and our minds and create illusions."

"Many controversies have been based upon seeing something differing from the reality." Page 65.

* * *

"WE ARE NOT DEPENDABLE SEEING-METERS"

"Perhaps these excursions into highways and by-ways of the subject may aid in eradicating the general idea that a human being is a dependable seeing-meter. * * * Seeing is by far more complex than experiencing weight and temperature."

"Vision is elastic. The focus of the eyes and of the attention varies from moment to moment. The effects of seeing take time to accumulate." Page 67.

"Everyone must be conscious of the fact that it takes time to see. The rate of growth and decay of sensations can be measured. Likewise, the human seeing-machine requires time to react and reaction-times are involved in seeing. Motion-pictures are made possible by the persistence of vision. Also it is generally conceded that we do not see when the eyes are in rapid motion. This is a fortunate development, because it eliminates the blurring of objects as the focus of the eyes moves from one place to another in the visual field. * * * The average stopping-time of the eye is \$0.17 second. * * * Briefest interval of time that it is possible for an observer to fixate an object in order to gain an adequate visual impression varied for the most part from 0.07 second to 0.30 second. The average was 0.17 second. * * * A critical detail of a size just visible when it is exposed to view for 0.3 second becomes invisible when the time is decreased. * * * If certainty of seeing for a given object is to be increased from threshold to 100 per cent certainty, the time available must be doubled." Pages 95-96.

* * *

"* * * minimum time required for seeing is considerably increased by the inadequacy of the other factors. Distractions are also effective * * * there is reason to believe that they have more influence upon the time factor than upon the others." Page 97.

* * *

"Normally, the ratio of the longest to the shortest time that the eyes require for vision is about four to one. Therefore, during the fraction of the time which the eyes must perform critical visual work, there is the possibility of changing the total seeing-time within these limits. A

gain of a few hundredths of a second may seem trivial, but in continuous visual work several of these gains are being made each second." Pages 97-98.

* * *

"PERTAINING TO DISTRACTIONS

"Distractions may be visual, * * *

"Distractions may be muscular and mental, both of which make demands upon sense-capacity and attention." Page 101.

* * *

"While the eyes are in motion they are anesthetized, in effect, * * *." Page 170.

* * *

"Seeing means work for the human being, just as manual labor does. But, unfortunately, the drain in nervous and muscular energy is unnoticed excepting under extreme conditions." Page 183.

* * *

"It is now known that the efficiency of the human seeing-machine is decreased if it must simultaneously do other things besides seeing. For example, noise decreases its efficacy in performing work. Operating an automobile, listening for tell-tale sounds, unwelcome noises and other things utilize some of the total ability or sense-capacity of the driver. His efficiency and efficacy as a seeing-machine are greatly reduced." Page 184.

ADDENDUM NO. 27

The following quotations taken from "Seeing—A Partnership of Lighting and Vision," by M. Luckiesh, D. Sc., Director, Lighting Research Laboratory, General Electric Company:

"The visual sense dominates the behavior of human beings. * * * It utilizes far more human energy than any other sense." Page 1.

* * *

"* * * when the temperature increases about 68 degrees Fahrenheit, fatigue is abnormally increased unless the cooling effect of the air is sufficiently augmented by setting it in motion. Noise is known to be a cause of fatigue and the minimum allowable is approximately known. The efficiency of the human body is about 20 per cent so it is not difficult to ascertain the difference in consumption of bodily energy * * *." Page 10.

* * *

"Eye-fatigue is not a simple product of inadequate and improper lighting. It involves inflammation of membranes, fatigue of eye-muscles and all the deleterious psychophysiological effects of annoyance in concentrating the attention or in trying to see."

"Approximately seventy per cent of the muscular activities is due to impulses received thru the eyes. * * * the eyes are engaged in serious work seventy per cent of the time. * * * it has been estimated that one-fourth of the consumption of bodily energy is due to seeing." Page 11.

* * *

"If we consider the nerve path, which is intermediate

between the applied stimulus and the muscle which responds, the breakdown appears to be possible at various points. The first failure is apparently just inside the central nervous system (spinal cord or brain)." Page 12.

* * *

"An organism such as the human being is infinitely more complex than any inanimate agent we can think of. As it begins to exhaust its supplies, it does not run at top speed, like an automobile engine, only to stop suddenly when the last drop of gas is burned; nor does it show in its activity a gradual loss of power, as does a dry battery, with the using up of its active material. It appears that, with moderate depletion, the human organism begins tentatively to anticipate further drains and to protect itself by reducing its activity without, however, being incapable of reproducing its original efficiency when demand arises. Such unconscious protection might take the form of mere indisposition or reluctance toward effort. Thus a person, brought into a laboratory to 'take a test' may not show a positive result in the test; but if left to himself, with casual supervision or none at all, his condition might readily be diagnosed as 'tired.'" Pages 13-14.

* * *

"It is difficult to fixate an object—to keep the eyes accurately fixed upon a point—for even a short period of time. It is impossible to do so for a long time. The tendency of the eyes is to shift their focal point slightly and very rapidly." Page 31.

* * *

"* * * the possible variable of a few hundredths of a second may represent the difference between accomplishing

the visual task with a glance or the necessity of interrupting the rhythm of working and looking again at the object. In another case, this difference may result in permitting an error or defect to be unobserved." Page 83.

* * *

"An apparatus was devised by means of which an observer was required to set a movable pointer directly under a similar stationary one. * * * By trial it was found that a period of two seconds was sufficient for making a reasonably accurate setting at the lowest brightness of background." Pages 85-86.

* * *

"Helmholtz is accredited with the statement that if a skilled optician should bring him an optical instrument as imperfect as the human eye, he would refuse to accept it." Page 157.

* * *

"However, in considering visibility, it is easy to make the mistake of omitting important conditions of usages. For example, a motorist has much to do besides recognize a signal or an approaching street-car. Several of his senses are at work operating the automobile, looking out for pedestrians, listening for familiar noises and perhaps advice is being offered from the rear seat. An object which would be readily distinguished if there were no distractions may be very difficult to see in the brief time available and with the senses already partly engaged. Actually, the visibility of the object depends upon psychological aspects as well as upon physical conditions. * * * the ability of the observer to concentrate and the degree of availability of the visual sense. * * * Noise is a part of influential environment. Al-

though it cannot be seen by the eyes, it is "seen" by the ears. It is distracting and it consumes some of the capacity of the worker." Pages 218-219.

* * *

"It is obvious that the influence of moving objects would be much more pronounced if they were within the view as well as within the hearing of the workers." Page 220.

* * *

"This is not due entirely to conditions for seeing, because persons differ in reaction-time." Page 31.

* * *

"SPEED OF SEEING

"It is obvious that any operation guided by sight, touch, or hearing and consisting of certain appropriate muscular movements, may be performed in less time when the external conditions are so adjusted that less time is consumed in the sense-organ which determines those muscular movements. For the lighting specialist the sense-organ to be considered is the eye, or more properly, the two eyes and what immediately pertains to them in their connection with the brain and the mind. * * * Obviously, there is a limit at which external conditions cease to increase the speed of seeing or of working. The limit is inherent in the chain of processes from the sense-organ to the completion of the visual task and in the return of the command from the brain to that part of the human being—hand, foot, voice, etc.—which completes the worktask." Page 73.

"From photographic methods we know that in reading the eyes jump from point to point and pause in a nearly stationary state between jumps. During the movements it is no more possible to receive adequate impressions than to read rapidly moving copy with the eyes stationary. Clear vision can only take place with the eyes stationary or, in the case of a moving object, with the eyes accurately following the object. As an example of the latter one may look at a revolving wheel. Most of the time the spokes appear blurred, but occasionally they may be seen distinctly and appear momentarily stationary. At these times the eyes happen to be moving properly.

"While the eyes are moving over stationary objects, such as reading matter, it would seem that vision would be blurred. Such is not the case, as is evident from casual observation. However, there seems to be good evidence that, owing perhaps to some readjustment which is taking place in the central nervous system, the eyes are actually blind during a part of such a movement. * * * fixational pause or period must be of a duration at least that necessary for adequate stimulation of the retina under the conditions." Pages 76-77.

* * *

"During the fraction of the time which the eyes must perform critical visual work, there is the possibility of changing the total 'seeing-time' within these limits. * * * The duration of the time spent in each separate visual operation is a compromise between a time that would permit leisurely seeing and the time allowed by the nature of the work to be done. * * * Unfavorable visual conditions, such as the demand for rapid visual work or the seeing

of small details or objects of low contrast, require the eyes to operate at or near the limit of their ability. If the conditions are unusually severe, the demands made upon the eyes may exceed their ability to perform the visual tasks with the result that the work is imperfectly done." Pages 81-82.

* * *

CONSTANT and VARIABLES
OF
ATLAS and AXIS MINUS ODONTOID

The study of this subject comprises the study of several of the fundamental subjects of anatomy. Before taking into consideration any of these subjects and their relationship to the atlas and axis it would be well to first determine the meaning of constant and variable. According to Webster and others, a constant is something fixed, steadfast or unchanging. A variable is something inconstant or changeable. It has been said that there are no two things in the universe identically alike. If this be true the laws of constants and variables will apply to all things. At the present I am primarily interested in their specific application to the atlas and axis vertebrae. Before showing this application it will be necessary to describe the typical and atypical vertebrae in question.

The atlas and axis respectively are the first and second vertebrae of the spinal column. The atlas articulates with the occiput, superiorly and the axis inferiorly. While the axis articulates with the atlas, superiorly, and the third cervical, inferiorly. This is one of the very important

articulations of the spine because of its allowing the head to flex and rotate, and is constant.

The atlas, being the first vertebra, will come under consideration now. It is classed as a peculiar vertebra because of its ringlike shape and absence of a body. Instead of a body there are two lateral masses, connected by an anterior and posterior arch, or ring. These masses support four articulating surfaces, two superior and two inferior. The anterior arch has an articulating facet, fovea dentails, for articulation with the axis odontoid process. Since we are specifically interested in the atlas-axis articulation the inferior facets of atlas are the ones of primary importance at present. These surfaces are generally much more constant in size and shape than the superior ones.

These inferior facets are circular in shape and slightly concave from side to side. From anterior to posterior they are somewhat flattened and incline outward and downward from the median line. In fact, a line drawn from their lowest tips to the center will form a well shaped arch. Upon examination of a large number of specimens I found they conform to the typical description in most cases. The most frequent discrepancy seemed to be as to their size and degree of concavity. As these facets do not make direct articulation with the axis, but are separated from it by the intervertebral disc, this disparity is not so important as it would be on the axis.

The axis, or second vertebra, is also a peculiar vertebra. The body of this vertebra supports two superior articulating facets on its superior surface. On the superior-anterior margin of the body is a process known as the

odontoid process, which articulates with the fovea dentalis of the anterior arch of the atlas. The superior facets articulate with the inferior facets of the atlas lateral masses, separated by a fibrocartilage disk, intervertebral disk.

These facets are elliptical in shape, somewhat convex from anterior to posterior and incline downward and outward. There will be found considerable variation of shape of these surfaces. There are very few that conform to the typical specifications in every respect, however they do have a constant as to certain points. There is always a body supporting two superior articulating facets and the odontoid process. There are other descriptive parts which are constant to this vertebra as, transverse processes and spinous process. But these do not enter into the atlanto-axial joint directly and need not be considered now.

There are variables of this axis as well as constants. As was stated before, it is my opinion that all constants do have variables. The fact that the axis always has the same set of descriptive parts makes that feature a constant and the fact that some of these descriptive parts are not always uniform makes that feature a variable of the constant. I will give as examples a few of the specimens found in the P. S. C. osteological laboratory.

Specimen No. 6, on which the superior articulating facets of the axis incline sharply to the anterior, rather than to the posterior. Specimen No. 150, on which the left superior facet is flat and round, while the right is large, inclines sharply to the side and is very irregular. Specimen No. 147, shows facets which are practically flat from anterior to posterior. These are only a few of the many variations to be found. There is no accounting for them

any more than there is for the reason all oak trees are identical, or all men identical, even though they have the general characteristics needed to identify their specie. But the fact that it is these superior articulating surfaces of the axis that furnishes the base upon which the atlas and occiput rotate makes their formation very important. The head might be compared to a balanced rock. As long as the base is undisturbed the rock may weave or lean many degrees out of plumb and still balance. Just let something go wrong with that foundation and down comes the rock. So if the atlas is precariously balanced on a malformed axis, it will take much less to throw it off balance and produce a subluxation. So we may conclude that if these surfaces are malformed there will be more variable possibilities than if it were normal. The malformation of this vertebra changes the fact that it is not a constant of that spine. It will take much less force to produce a misalignment of sufficient degree to cause pressure upon the cord.

Here another fact comes into the picture which may be classed as a constant. These articulating vertebrae are held in position by ligaments and moved by muscles. The ligaments hold the vertebrae so that they may always have freedom of movement within a normal range. I might briefly enumerate the ligaments of most importance in this joint.

The anterior atlanto-axial ligament attached to the anterior arch of the atlas and to the superior surface of the body of the axis.

The posterior atlanto-axial ligament attached to the posterior arch of atlas and to posterior surface of the lamina of the axis.

The transverse ligament dividing the atlas into two unequal parts and passing just back of the odontoid process.

The capsular ligament surrounds each articulation as a membranous sac.

There are ligaments attached to the occiput and binding various points of the vertebrae together. Between the articulating surfaces of these two vertebrae are fibrocartilagenous discs called the intervertebral discs. These discs absorb shock and make the joints more pliant and easy to move.

The next consideration is what makes them move. If there were no motion there could be no variables of position, which is the factor we are so interested in. It is by variables of position we get subluxations producing pressure upon nerves. Muscles in which we are most concerned are the paired ones. Those muscles which rotate the vertebrae and keep them from tipping and slipping side-wise. I might just name a few of them:—the rectus capitis anterior, rectus capitis lateralis, inter-spinalis, rectus capitis posterior, obliquis capitis inferior and superior.

Now we have established a joint, two adjacent vertebrae held together by ligaments and activated by muscles, for the purpose of obtaining motion. Those two vertebrae in their relative articulating positions which are always the same, form an arthrodial or gliding joint. The purpose being to allow for movement of the head. As the head rotates from side to side it takes the atlas with it. The gliding motion is obtained through the atlanto-axial articulation. It would seem that the atlas acts as a swivel, so to speak, between the occiput and the spinal column. Its

action is analogous to that of the swivel in a chain which acts as a means of allowing the chain to turn without twisting. In instances when the swivel fails to function, by becoming locked, a broken chain may result. The atlas can also become locked and instead of any form of breakage occurring, there is an impingement of nerves and an interference to transmission of mental impulses, a subluxation.

The truly typical vertebrae are very rare and likewise the typical articulation. From the past description of the atlas and axis and their relationship it should be easy to visualize their manner of articulation. The inferior surfaces of the atlas rest upon the superior surfaces of the axis somewhat as two inverted plates rest upon each other. Separating these surfaces are the intervertebral discs which act as a type of bearing and furnish lubrication for the joint.

The atlas is held from going to the posterior by the odontoid of axis, which articulates with the posterior surface of the anterior arch of atlas. It is held to some extent from going anterior by the transverse ligament. Here we have another constant. The fact that this articulating relationship is always the same as to location and structures involved. This statement of fact remains the same regardless of how atypical the structures may be as to sizes and shapes.

To illustrate this, let us again consider some of the specimens in the osteological studio. Specimen No. 125 of atlas and axis. This specimen shows the right lateral mass of atlas heavier than the left and the facets being dissimilar on the corresponding masses. The right facet

was larger than the left and less anterior to posterior concavity. On the axis the sizes of the facets seem to conform to those of atlas in general shape. The right being larger and slightly convex; the left, small and more convex. As in most of these specimens there has been some pathology. Here the odontoid has been lengthened by exostosis to prevent the anterior arch of the atlas slipping over. Also indications pointing toward a rotation. These conditions are not to be expected of a normal vertebra, taking the truly typical specimen as a standard. Nevertheless, it may have been a truly normal vertebra for that individual and caused him no discomfort. But at the same time the variable possibilities were increased in proportion to the degree of deformity of the structure. In other words, the right articulation by being larger and flatter, offered less of a resistance to the concussion of forces than the better locked left side. So it would seem that there was a natural susceptibility to a misalignment from the right side. However, this does not mean there could not be misalignment from the left, if the forces of concussion were great enough from that direction. There is also the possibility that the range of variations of positions would be more easily acquired when the head rotated from the right side and back, than from the left to right.

Another interesting specimen was No. 245. Atlas, axis and third cervical held intact by some of their ligaments. Here we get more fully the relationship of this articulation. It may readily be seen that the left lateral mass is more posterior than the right, showing a left rotation of atlas. A line drawn from the center of the posterior tubercle through the anterior tubercle shows some inferior-

ity of atlas and the space between the anterior arch and odontoid shows the anteriority of atlas.

By looking from superior to inferior through the neural canal we can readily see the possibility of cord pressure as the posterior arch moved right in a left rotation and up in inferiority and forward in anteriority. Again we see a case in which the condition may have not produced sufficient pressure to cause disease, but its potentialities of variability had been greatly reduced. This reduction would necessitate a great deal less force to increase the misalignment to the point of subluxation than if its variabilities had been normal.

I have heard that a good showman saves his big attractions for the last. So I shall do the same. It is a very rare specimen. I shall call it, Dr. B. J. Palmer's "Wet Specimen". It was made under conditions which I shall only briefly explain. A great deal of time and expense were required to obtain a specimen as soon after death as possible and to retain the occiput, atlas and axis in the exact relative positions as prior to death. The body was frozen and these structures bound together by catgut. A long drawn out and complicated process of removing the bone materials, leaving the animal matter. It was placed in the Spalteholz transparency fluid in a glass container, and may be viewed from all directions. The subluxation is definitely brought out. An A. I. R. is shown. By viewing it from the superior we may readily see wherein there was a reduction of the size of the neural canal by the misalignment and subluxation. It would seem evident by these examples that any reduction of the normal variables of the atlas may cause some pressure. The amount de-

pending upon the degree of reduction of the variable possibilities.

Let us consider the variables of position of the atlas because that is an interesting feature of the chiropractor's work. As has been previously stated this is a gliding joint providing for rotation and flexing of the head. The axis has only a small range of motion owing to its mechanical lock, with the third cervical, by the zygapophysis.

The atlas may move laterally, anteriorly, superiorly and inferiorly within a definite normal range which cannot be estimated in figures. By the use of the spinograph it has been proven that the atlas does move out of its normal range. The result is a misalignment when this misalignment reaches the point of producing an impingement upon nerves or occluding foramen it is termed a subluxation. There is no question but what there are pressures produced in the normal body, and then corrected, every day. But some of them are of such a degree that they cannot correct themselves. The atlas may become locked in this subluxated position and it will need assistance to be unlocked. This is the chiropractor's work.

The normal variables of any vertebra and especially the atlas consists of the extent of movement in any direction from a median line without causing excess pressure upon the medulla spinalis or a spinal nerve. As mentioned previously this movement cannot be measured and will be different in every individual. The variable of structure may have a great bearing upon the variable possibilities of the movement of that structure. For instance if the lamina of the atlas was shorter on one side than the other, the

long side could not move as far toward the median line without producing pressure. Hence its variable possibilities have been reduced by the abnormality of structure.

In so much as we are discussing the atlanto-axial articulation, the axis must not be forgotten. There is not a great deal of movement to the axis although what there is may be important. The axis may rotate slightly and may tip inferior and superior. Of course it is understood we judge the extent of the movement of the axis by the position of its spinus process. However after examining a great number of axes, I am inclined to believe that the trouble has been more from malformed and bent odontoids than by tipping of the axis.

There is one point that does seem to have some bearing on this articulation. That is the rotation of axis even to a slight. It serves in the role of accessory after the fact, as lawyers would put it. Just for the sake of discussion let us assume a hypothetical case. An atlas is in a right rotation which places the posterior tubercle to the left of the median line. The axis is slightly in a left rotation. Here are two opposite movements either one of which may not produce sufficient pressure to be classed as a subluxation. But the two together, then what? The variable possibilities of each has been reduced in direct proportion to the degree of misalignment of the other. The scissor like movement has greatly increased the pressure. And, it is only when these pressures become great enough to cause incoordination of body function and when Innate cannot correct them that outside assistance is needed.

While we are hypothecating there is another possibility I would like to mention. The question has been asked,

"Can an atlas move anterior on one side without the opposite side going posterior?" I can see no reason why such a case could not exist altho I have never seen a spinograph of one. If there be an acute pressure shutting of the nerve supply to part of the supporting structure on one side I see nothing to prevent their opponents from drawing the atlas in the opposite direction. The formation of the facets would also enter into this picture as shown in the description of specimen No. 125. Here we had a natural tendency of one mass to move more easily than that of the other. Allowing for a loss of tonicity of the posterior group of attachments on that side would tend to allow that mass to move anterior.

Why should there be so much fuss about the variables of position if the range of movement is so slight? To answer that question satisfactorily a few facts should be recalled. The discussion so far has dealt primarily with the atlanto-axial articulation. That however does not give the whole story. Attached to each of the lateral masses of atlas are two boney projections, called lamina, which extend to the posterior and medialward. Here they unite in a union known as the posterior tubercle, which should be in the median line, normally. Like structures attach to the posterior lateral margin of the bodies of other vertebrae but terminate in a union known as the spinous process. The vertebrae thus formed and in their normal relationship present a canal between their bodies and spinous processes. This canal known as the neural canal permits the passage and protection of the medulla spinalis or spinal cord. Now we may see wherein the movements of this articulation can and do affect the spinal cord.

The neural canal is not always the same shape. It may be round, elliptical or triangular in varying degrees. But no matter what the shape, Innate sees to it that the cord will conform, and endeavor to eliminate pressures upon it. This she is not always able to do and then is the time and place for chiropractors.

We have now the following points established as constants, 1. Certain descriptive parts common to all atlases and axes; a definite relationship of their articulating surfaces; a definite anatomical location in relation to the spinal column; definite sets of ligaments binding them together; certain muscles to produce their movements and definite functions as a result of these movements.

All of these points are always in the same relationship, individually and collectively. However, as formerly stated they may be atypical or malformed, which would be a variable of the constant of typical structure. Any change taking place would be classed as trauma or Innate adaptation to protect delicate structures, especially the spinal cord.

We have also determined certain variables of this articulation; those features which do change in all normal articulations and in most articulations. Among these points we have found, the movement of the atlas is usually to the anterior on one side or the other but occasionally directly anterior; the atlas may slip sidewise upon the axis either to right or left; the anterior ring of the atlas may go superior or inferior usually as the atlas moves anterior; the atlas may rotate around the odontoid of axis. In a rotation one lateral mass moves anterior and the other moves posterior on the corresponding facets of the axis.

It seems this movement may produce more pressure more quickly than any one of the others. It is present in the greater percent of subluxations.

All of the above mentioned movements are perfectly normal and are made several hundred times a day in every normal articulation. In all of them we find the gliding motion as the facets of the lateral masses move upon those of the axis. If the functioning of this articulation were as easy as the stating of these facts bodily incoordination would be unheard of and we would truly have the proverbial, "Heaven on earth." But so long as these movements come under certain mechanical laws we must expect some troubles. Although Innate is a very competent mechanic she cannot do a thorough job when deprived of some of her tools. The tools she needs are intelligence, force, and matter. The tools intelligence and matter are present, but due to a subluxation there is not sufficient force supplied to do a good repair job. A subluxation has been produced by a concussion of forces to which the structures could not adapt. Pressure resulted, and Innate was deprived of her much needed tool, force, which is the connecting link between intelligence and matter. This misalignment became a subluxation when the vertebra in question had been deprived of some of its variable possibilities by becoming fixed in a misalignment, thus producing pressure upon nerves, or the occluding of a foramen. The constant was still present but the variable potential had been lessened.

After examination of a great many specimens and X-rays I find that there are very few, if any, perfect vertebrae. This being the case it would seem as illogical to

expect a perfect articulation with imperfect vertebrae, as it would to expect to build a nice house with crooked and warped lumber. So, in view of the fact that there are so few perfect structures, it behooves us to consider seriously the structure before attempting to restore a normal range of variables to an abnormal or malformed set of structures. These atypical structures are constant to that individual and a range of variables which are sufficient to prevent pressure but beyond that point we cannot go. I am not referring to reduction of variable potential by adaptative exostosis because this was only a defensive measure and when no longer needed will be removed by Innate. But, I do believe that the greater the abnormalcy of structure, the less the variable range and the greater the subluxation potential. The subluxation present here, may be no more severe than in an individual having a normal articulation, but there is a greater possibility of its increasing or even recurring, all other elements being favorable.

Spinograph and especially the stereo has proven an indispensable factor in determining the exact conditions of the structures and their relationship. Especially is this true of the atlanto-axial articulation. I have been able to observe the gradual return of the variable range of atlas and axis to normalcy, by comparing stereo sets taken at regular intervals. It is possible to note the changes in the relative positions of their articulating facets as they returned to their normal positions. It is possible in some cases to observe the changes as the variable of structure returns to its normal typical specifications as to shape.

All of these facts sum up into this conclusion. Every vertebra is a specific constant within itself having a spe-

cific set of variable potentials which perform a specific function in direct proportion to the quantity and quality of matter present. Each case should be studied as an individual and correction given in accordance to the needs of that individual.

Myatt W. Myatt, D. C.

April 14, 1936.

CONSTANT AND VARIABLES OF ARTICULATIONS OF CONDYLES WITH ATLAS

The Chiropractic premise that a vertebral subluxation is the cause of dis-ease is sound; that when a foramen is occluded interference to transmission results and consequently incoordination between consciousness and matter. This is the fundamental principle that Chiropractic has shown the world; has demonstrated its efficacy by employing its method, that of adjusting the subluxated vertebra, allowing the internal forces to re-establish the Constant and permitting a complete restoration of energy to flow between the brain and dis-eased periphery.

The body with all its complex organs is timed perfectly; each organ with the other, in perfect health. The function of the nervous system is just this coordination. A vertebral subluxation is the proverbial monkey-wrench in the machinery, throwing the entire body out of order.

Chiropractic has progressed from its beginning of adjusting every raised bump one palpated, to a specialized science. Today we know that a Constant interference to transmission below Axis is impossible, although misalign-

ments are present. We know definitely that the Condyle-Atlanto-Axial region is the weak link in the human spinal column; that due to its osseous structure a subluxation is possible. Thru this region all of the spinal nerves pass, accompanied by visceral and cranial nerves. It can truly be termed a dangerous place for cord pressure to exist, due to the countless number of nerve fibres present.

The condyle and Atlas articulation permit nodding of the head forward and backward, from side to side, and extension and flexion. The superior facets of the Atlas are best suited for just this function being concave elliptically shaped structures which converge in front and diverge behind, forming a cup or socket for the condyles. The condyles differ in many respects. They are two convex prominences situated on the lateral anterior margin of the foramen magnum, forming a double diarthroses of the condyloid type. The Constants and Variables of these two structures are presented. The facts have been gained from the B. J. Palmer Osteological Studio.

Definitions by Webster: Constant is defined as "remaining unchanged or invariable as a quantity, force, law, etc." "Variable is that which is variable; that which varies or is subject to change."

According to Gray's Anatomy, the typical condyles are oval or reniform in shape, and their anterior extremities directed forward and inward, are closer together than their posterior, and encroach on the basilar portion of the occiput; the posterior extremities extend back to the level of the middle of the foramen magnum. The articulating surfaces of the condyles are convex from before, backward, and from side to side, and look downward and lateralward.

The Atlas is a peculiar vertebra, the body fusing to the second vertebra inutero and forming odontoid of Axis. It is termed a peculiar vertebra due to it being constructed differently; possessing no body but two lateral masses, an anterior and posterior ring and having no spinous process. The Atlas is so constructed for its proper function of supporting the head and for rotation on Axis. The superior facets of Atlas are located on the lateral masses which are oval, concave in shape, approach each other at their anterior and diverge at the posterior; they are directed upward, inward and slightly backward.

From the definition of Constant; the application to condyle and Atlas vertebra would mean that any slight deviation in their structure and position from the normal would not be Constant but a Variable; the Constant always being the typical or normal.

The Constant of the occipito-atlantal articulation as to position is that place where there is no resistive muscular tension; any other position would be Variable to the Constant of position.

The Variable is the range of abnormal movement of the articulation. This would become a subluxation which is a fixed increase in the range of the Variable potentialities, diminishing the calibre of the neural canal and create pressure on nerves.

In case No. "0", the skull and Atlas show the remarkable abilities of the body to maintain its Constant transmission of energy if the limitations of its reparative abilities are not exceeded. The condyles, having been destroyed, permitted the Atlas to subluxate to such a degree,

that in order to maintain life an ankylosis of the lateral masses of Atlas to condyle was the only adaptation possible, as a result the Constant, a diathrodeal joint, was destroyed. The listing of Atlas is ASL left transverse process anterior. The Atlas had rotated until the styloid process of the temporal bone arrested any further increase in the Variable in that direction. The anterior tubercle of Atlas is crowded against the basilar portion of the occipital bone which plainly shows the extreme severity of the anteriority and superiority. The lateral slipping was to such an extent that the left transverse process is almost touching the mastoid. This subluxation of Atlas reduced the foramen area that immediate steps were taken by Innate to reduce the increasing of its Variable potentialities; as a result the foramen magnum is larger than the normal due to the subsequent adaptations following. This was brought about by tearing down of the occiput and Atlas where it projected into the canal and produced pressure. The right half of the posterior arch is a mere spicula, and the posterior tubercle is gone, clefing of the Atlas resulted in order to release pressure on the posterior position of the medulla spinalis. All the changes were the struggle of Innate to establish a return to a Constant flow of energy by increasing the lumen of the spinal canal.

Case No. "X", the Atlas had subluxated so that the articulation of condyle and Atlas had gone beyond its own Variable limitations; creating cord pressure to such a marked degree that when viewed from the superior, the entire posterior ring of Atlas can be seen projecting into the neural canal, that a return to a normal articulation was impossible. An ankylosis was constructed by the osteoblasts and osteoclasts, to retard any further increase in

the reduction of the Variable of the articulation. It is interesting to know how Innate cemented this joint. The superior facets of the first vertebra are located anterior and inferior to its condyles. An osseous attachment was produced between these two surfaces, and for further reinforcement, bridged bony material across the space between the superior ridge of the anterior ring of Atlas to inferior surface of the basilar portion of the occipital bone. In this manner, Innate's reconstructive forces were utilized, making an immovable joint and thereby discontinuing any further increase in the Variable potentialities. An adaptive Variable was the result, the articulation having lost its Constant as to position, function and structure.

Today, in determining a subluxation of Atlas by the spinograph, we must constantly be on guard for any anomalies of Atlas and condyles. A few Atlas and condyle findings will be mentioned; showing how the malformation of any of its descriptive parts could create a false interpretation of its subluxation.

The site of the left condyle is anterior to the right one on the foramen magnum. The spinograph would reveal the following: the left lateral mass would be larger, the posterior tubercle would be to the left of the median line; the portion of the left lateral inferior tip of Atlas under the posterior ring would be smaller than that portion on the right. The Chiropractor analysing these X-ray films would come to the conclusion of a right rotation of Atlas if he were not aware of the malpositioned left condyle. A diminution of errors of interpretation is desirable which could be accomplished by recognition of the various anomalies possible.

Another anomaly of Atlas, showing that in its development the center of ossification of the left lateral mass had been retarded in some manner so that the left portion of the posterior ring is shorter; the posterior arch finally uniting and forming the posterior tubercle well to the left of the median line. The left medial side of the neural ring of Atlas is straight instead of concave and projects into the spinal canal. On a spinographic film, depicting just such an anomaly we would form a listing with a pseudo right rotation, the right transverse posterior, the left anterior. This Atlas shows us a Variable which would increase our reduction of the neural canal more so if subluxating with a left rotation. This would bring the shortened straightened posterior arch into the lumen, squeezing the spinal cord tremendously. A Chiropractor would do just this if he did not interpret this false rotation. The tendency would be to increase the already reduced Variable by adjusting that case for a right rotation in the subluxation.

The degree to which an Atlas subluxates depends upon the quantity of the external or internal force and the formation of the articulating surfaces of Atlas and condyles. In Atlas specimen No. 11, the superior facets of Atlas are entirely flat and are directed "downward," inward, and backward. The amount of force required to subluxate this Atlas would be slight, the direction of malposition of the articulation depending upon the direction of the invasive energy and the bony structure of these vertebrae. The Atlas would go inferior due to its facets facing "downward" instead of the typical upward aspect. The shape of the Atlas facets and the direction of the invasive force will give

that articulation its fixed increase in the range of the Variable potentialities.

In studying the condyles a striking anomaly was brought to attention that due to consistently showing up regularly, it is worth mentioning. Of ten pair of condyles studied for this purpose, five of them exhibited the same characteristics, i. e., that one condyle was longer (from its base to the articulating surface) than its mate. In normal articulation with Atlas this Variable would tilt the head up on the long condyle and vice versa on the shorter one, producing a wedge which is not a true one resulting from a slipped Atlas. On an X-ray film this condition could produce either an exaggerated wedge or none at all if the Atlas had subluxated. For instance, the right condyle of No. 2150 is shorter than the left one, which would produce a right tilt or wedge of the head in articulating with Atlas. If the Atlas were to lose its position to the right the wedge would be greatly pronounced but on the reverse, the wedge would probably be obliterated. Here is shown how a Variable of condyle can distort a listing as laterality. Probably this Variable of the condyles explains why some heads are always tilted to one side.

Only two sets of condyles from the ten selected are Constant to the typical. It seems as though a Constant is more of an exception than a rule. The ten pair of condyles are listed as follows:

1. No. 502.

The left condyle is longer from superior to inferior, both condyles are positioned $\frac{1}{4}$ " to the right of the median line.

2. No. 525.

The left condyle is longer from superior to inferior, otherwise they are typical.

3. No. 508.

The right condyle is longer the articulating surface to its base. Normal otherwise.

4. No. 511.

A typical or Constant set of condyles.

5. No number.

Same as No. 4.

6. No number.

Articulating surface of the left condyle is greater than the right one.

7. No. 505.

The right condyle is shorter, the articulating surfaces are almost parallel with each other.

8. No number.

The condyles are placed obliquely on the edge of the foramen magnum and the left condyle is anterior to its mate, otherwise appear typical.

9. No. 521

The before to backward length of the right condyle is greater than the left one and is lacking the side to side convexity.

10. No. 2150.

These condyles are double, being divided into two articulating surfaces; the side to side convexity is absent and the right condyle is shorter in height, than the left one.

In No. 2150 we find a radical departure from a normal condyle. The abnormal development of the structure has restricted the Variable of that particular head as to movement. The only Constant of this articulation would be that position in which there would be no resistive pull. A wedge side slip would enter due to the uneven development of one condyle to the other and also showing that only two condyles are Constant to the normal.

In conclusion, let me state, that this brief study of Atlas and condyle has increased my knowledge; the only regret being that all I have gathered, those indefinable known quantities, which are impossible to put in writing.

Henry Wasmuth, D. C.,
April 22, 1936.

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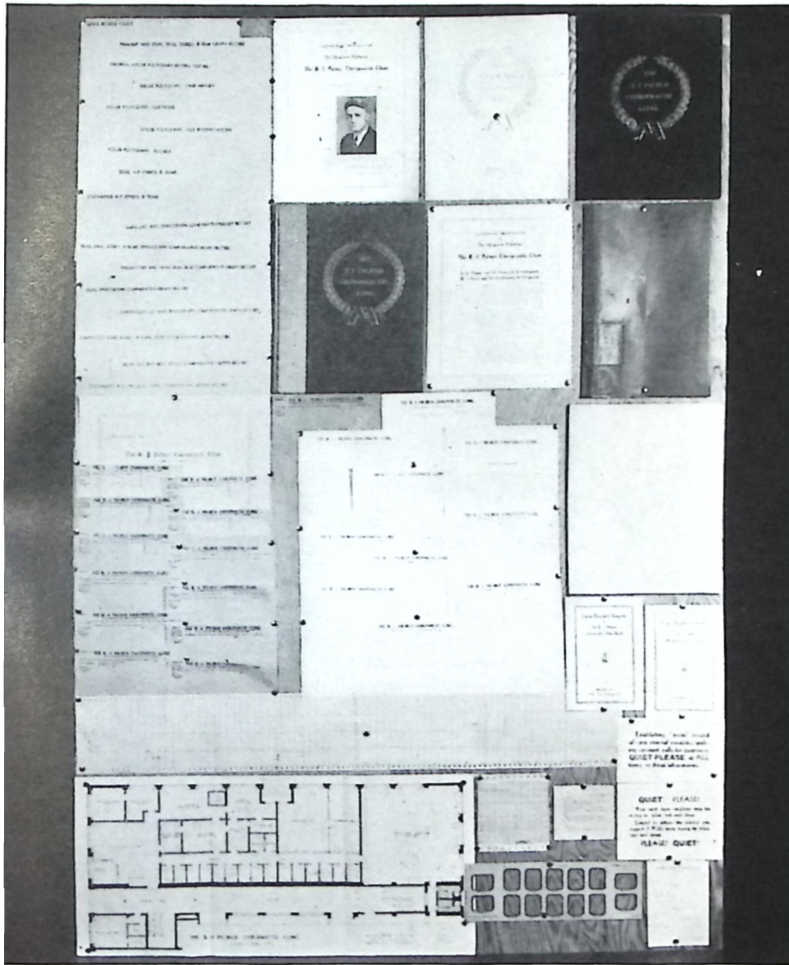


FIG. No. 34

Printed forms, publications, etc., exhibited on both pages are necessary to carry on and conduct the securing and dissemination of quantity and quality of work done in The B. J. Palmer Chiropractic Clinic. None is duplicated on either page. More have been created since these photographs, as new work was conceived. In addition to these, many printed circulars and booklets are in racks at Clinic entrance, which patients may have for the taking.



PUBLICATIONS
OF
THE B. J. PALMER CHIROPRACTIC CLINIC

The Clinic Brochure.

Floor Plan Drawings.

Supplements of Case Reports.

Book of Views of Clinic Offices, Laboratories and
Equipment. (Ready for delivery about Christmas, 1936.)

THE B. J. PALMER CHIROPRACTIC CLINIC CASE
FILE RECORDS CAN BE HAD

Up to date of publication of this book, we have said little about our case files, record forms, records of ascertaining and filing laboratory, X-ray, chemical, graph, neurocalometer, neurocalograph records, etc. We believe our system second to none—no other clinic excepted. We are frequently asked for a complete set of these records. We have so far refused, because of our desire to further test their utility, change and adapt them as work amplified itself, throw out some forms and establish new ones as new departments and greater exactitudes were demanded. At this time much of this work has been standardized. Complete sets of all forms, with case file wrappers, etc., will be furnished to any Chiropractor for \$15.00 plus postage. This will include all forms illustrated in this book and more, subject to whatever changes or additions have been made since photographs were taken.

Getting sick people well is just a little the easiest **CONSTANT** we do here **IF—**
and, it is those **“IF” VARIABLES** that The B.J.Palmer Chiropractic Clinic eliminate





